

## ENGINEERING INVENTIONS.

A car coupling has been patented by Mr. Joshua H. Dymond, of Carbondale, Kan. It is designed to couple automatically, the two ends of the link being alike, and the drawheads alike at both ends of each car, and so made that either end of any link will engage either end of any car.

A steam boiler has been patented by Mr. George G. Tindall, of Oakland, Cal. Combined with vertical spaced walls of a firebox is a special construction of downward-curved crown sheet, with other novel features, making a boiler particularly adapted for burning straw and other light substances, such as needed for operating thrashing machines and for similar uses.

A rotary engine has been patented by Mr. Dennis McColgan, of Butte City, Montana Ter. This invention covers improvements on a former patented invention of the same inventor, in an engine where a wheel having a U-shaped groove in its face forms the cylinder or steamway, the present improvements being in contrivances of the valve gear, ports, and reversing valves, with various other details.

A metallic railway tie and fastener has been patented by Mr. Robert R. Shepard, of New York city. The tie is hollow, and of an inverted trough-like construction, carrying raised lips to receive the base flanges of the rails, and opposite these lips are key hole apertures to hold a detachable locking key or button to hold the rail down to its place on the tie, with facility for releasing the rail if desired to take it up.

## AGRICULTURAL INVENTIONS.

A comb for grass seed harvesters has been patented by Mr. Jacob I. C. Naff, of Winchester, Ky. The teeth are adjustable to adapt the comb to seed at different stages of ripeness and to different kinds of grass, and the construction is intended to secure a strong and good connection of the teeth to the comb, and facilitate the manufacture.

A harrow has been patented by Messrs. Conrad Fischer and Louis Grother, of Brownsville, Mo. The harrow frame is made of a series of bars with open-sided sockets to receive the teeth, braces with their ends bent at right angles closing the open sides of the sockets, the level of the sockets permitting a different inclination of the teeth when the harrow is drawn in a reverse direction.

## MISCELLANEOUS INVENTIONS.

A note and memorandum book has been patented by Mr. Adolph Pester, of Brooklyn, N. Y. It is a book which may also be used for a toilet, sewing, or other case, and has a flap to rest on the front, with a pocket or loop for receiving a pencil, scissors, rules, or similar article.

A wrench has been patented by Mr. John McLean, of Camden, Ark. This invention covers a special construction of wrench convenient to use in situations where little room is afforded for access to nuts, bolts, or other work requiring to be turned or held, the implement being simple and durable.

A calendar cuff button has been patented by Mr. Garcia Monteiro, of New Bedford, Mass. It has a longitudinal box or shell with two or more transverse slots, and in the box are strips and spindles to be turned by a key, making an adjustable device for showing dates through slots in the button.

A smut mill has been patented by Mr. Jacob Fitz, of Hanover, Pa. This invention covers a novel construction of a mill to first violently agitate the grain and scour the kernels, and then to retard its progress through the mill that it may be thoroughly cleaned and the dust withdrawn.

A medical compound has been patented by Mr. John O'Flaherty, of Lachine, Quebec, Canada. It is composed of powdered sulphur and hierapicra, in certain proportions, and to be applied in a definitely stated manner, for the treatment of rheumatism, gout, lumbago, sciatica, and other similar affections.

A bicycle handle has been patented by Mr. Robert Rodes, Jr., of Nashville, Tenn. The construction is such that the handles can be swung upward and together by the forward movement of the rider when he is thrown forward by accident, thus permitting the rider to jump from the front of his bicycle.

A sewing machine cabinet has been patented by Mr. William H. Hiteshew, of Peru, Ind. It is so arranged and constructed that when the top of the cabinet is closed the machine is automatically lowered through an opening in the top of the cabinet, and is raised automatically out of the cabinet when the top is raised.

A head rest has been patented by Mr. Charles E. Neeley, of Gurdon, Ark. It consists of a head piece upholstered on one side and having on the other side a mirror, there being also a clamping device adapted to be secured to the back of a railway car seat or other chair, in which the head piece may be adjustably held.

A cant hook has been patented by Messrs. Harry C. Crawford and Edwin V. Mundy, of Duluth, Minn. This invention consists principally in making the handle socket in two parts arranged to be clamped to the handle by suitable clamps or ferrules, so that should the handle break a new one can be easily inserted.

A magazine spring gun has been patented by Mr. Amedee J. Benjamin, of Valley Falls, R. I. The barrel and magazine have guide slots in the sides, with a crosshead fitted to slide therein, the object being to provide an improved toy gun adapted to shoot several arrows or darts without reloading after each shot.

A chain socket has been patented by Mr. James F. Thomas, of Denver, Col. An internally screw-threaded socket has a notch on its outer end, with other novel features, making a socket to be used on furniture for holding the ends of chair rounds in place, also to hold drawer pulls and knobs, and for other like uses.

A thill coupling has been patented by Messrs. Major Hall and John C. Ryan, of St. Paul, Minn. This invention consists in a packing formed of an inner elastic block or deadener and an outer metallic casing, with a clamping or adjusting screw to take up any slackness in the joints, and free the thill connections from annoying rattling of the parts.

A bow-facing oar has been patented by Mr. Marcus M. Clark, of Vermont, Ill. Combined with an oar and lever is a plate or rod forming a curved guide for the fulcrum of the lever, with crossed rods connecting the lever and oar at opposite sides of the fulcrum, so that a person propelling the boat by oar can face the bow.

A painter's sander has been patented by Mr. Joseph P. Ryan, of New York city. It comprises a box with perforated bottom, an air chute and sand chute of special construction, with other novel features, whereby sanding can be done above and below the level of the sander, or at either side, without moving the sander from a horizontal position.

Checks, drafts, and other money orders form the subject of a patent issued to Mr. William T. Doremus, of Flatbush, N. Y. This invention provides a special form of blank so spaced and numbered that when a check or draft is properly filled out therein it cannot be readily raised or made to represent a larger sum than that for which it is drawn.

A gas regulator has been patented by Mr. Joseph D. West, of East Orange, N. J. This invention covers a novel construction intended to equalize the pressure of gas at the point of consumption, whether the gas in the supply pipe be under heavy or light pressure, and whether the gas is being consumed at one or more burners in the same service pipe.

A churn has been patented by Messrs. Frank A. Houck and Thomas C. Carter, of Holden, Mo. The invention consists principally in attaching the arms of the upper dasher to an upright plate that revolves around the main upright shaft and agitates the cream at the center of the churn, two dashers being used, revolving in opposite directions.

A wagon brake has been patented by Mr. Albert K. Barmore, of Milano, Texas. It is so constructed as to be operated by a few short strokes of a lever, which tightens a cord until the brake block exerts the required pressure, when a catch holds the brake lever in position until released, the device being easily made and applicable to all kinds of vehicles.

A paper keg or cask has been patented by Mr. Charles H. Wickersham, of Pottstown, Pa. The shell is formed of a sheet of board notched at its four corners and bent into cylindrical form, the edges of the board between the notches being overlapped and secured together, and end caps fitting over the ends of the cylinder, making a cask adapted for holding nails, etc.

A windmill has been patented by Mr. Pha Tefft, of Saguache, Col. Its sails or vanes are pivoted eccentrically to radial arms of a vertical shaft, which means to balance and stay means to hold them, and rods extending down the shaft to be manipulated from the ground to stop and start the mill, the object being to make a simple, efficient, and durable mill.

A piano stool has been patented by Mr. Claude W. Blackburn, of Chicago, Ill. This invention covers a special construction intended to facilitate the rapid adjustment of the seat to the desired height, for which it is only necessary to lift it with the hands, when it is automatically held where placed, the stool being cheap, strong, and not liable to get out of order.

A metal mould has been patented by Mr. Thomas O. Bennett, of Atlantic Mine, Mich. It has fixed sectional portions with beveled lips, with yielding sections forming a portion of the sides, with ends beveled to fit the beveled lips, with springs to control the yielding sections, making metal moulds adapted for casting a variety of articles of different construction and shape.

A carpet stretcher has been patented by Mr. John J. Taylor, 2d, of Warren, Pa. A grooved bar holds a sliding rack, the front end of the rack being pivoted on the bar, while there is a U-shaped frame with a wire or rod as a fulcrum for a lever engaging with the teeth of the rack, and used for moving the rack in the direction of its length, the device being easily operated and folding compactly when not in use.

A repeating firearm has been patented by Mr. Athanas Chuchu, of Bahia, Brazil. Combined with a stock and a barrel hinged thereto is a plate hinged on the breech end of the barrel to prevent the cartridges from falling out, the plate having a single aperture through which the firing pin can strike the barrel, making a pistol occupying but little space in the pocket and presenting advantages similar to those of a revolver.

Knockdown furniture is the subject of a patent issued to Mr. Joseph B. Brolaski, of St. Louis, Mo. This invention is an improvement on a former patented invention of the same inventor, and is intended for the manufacture of various articles of household furniture, as bureaus, washstands, sideboards, kitchen safes, desks, etc., which are by this invention so constructed that they can be folded very compactly for transportation, can be erected and taken apart easily, and stand rigidly and firmly when set up.

Mr. Lazarus Goldenberg, 219 E. 30th Street, New York city, is the patentee of a portable electric light arrangement for lighting rooms or buildings temporarily by electricity. The invention consists principally of temporary or false moulding supports made in sections, and provided with electric conductors which are held along the walls at the ceiling by temporary pillars. Entire buildings or special rooms, such as parlors, ballrooms, churches, etc., may thus be provided with temporary electric lighting appliance for special occasions, which may be quickly put in place, and which, besides furnishing the electric light, will also ornament the room, and will not injure the ceilings, walls, or floor, and can be readily removed after use.

A drip cup for lamps has been patented by Mr. Edward A. Condit, of Hoboken, N. J. It is a cap with internal staples and a bail to attach to a loop below the lamp bracket or lamp chandeliers, to obviate the difficulty caused by overflows or dripping.

## 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.

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Seam and Looping Machines, patent Burr Wheels, Brushing Machines. Tubbs & Humphreys, Cohoes, N. Y.

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Estimates furnished for all kinds of machinery tools and supplies, steam plants, etc. Beaudry's Upright Power Hammer, Webber's Centrifugal Pumps, and Balance Dynamometers a specialty. Correspondence solicited. Beaudry & Cunningham, Boston, Mass.

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Cutting-off Saw and Gaining Machine, and Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Best Automatic Planer Knife Grinders, Pat. Face Plate Chuck Jaws. Am. Twist Drill Co., Meredith, N. H.

Curtis Pressure Regulator and Steam Trap. See p. 12.

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Wanted.—Patented articles or hardware specialties to manufacture on contract or to manufacture and place on the market. First-class facilities. Correspondence solicited. Address Hull Vapor Stove Co., Cleveland, Ohio.

Roofing Slate, best quality, shipped to all sections in any quantity. Jesse B. Kimes, Philadelphia, Pa.

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## Notes &amp; 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 Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service 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) D. S. M. asks: What is the proper test for iron in water? A. Concentrate the water by heating to comparatively small bulk, then add a few drops of potassium ferrocyanide. A blue coloration is indicative of iron salts. Iron is not ordinarily objectionable in drinking water, but is an excellent tonic.

(2) H. K. writes: In your directions for making artificial marble, June 13, query 2, you say, "Soak plaster of Paris in a solution of alum." Can you state the process more explicitly? A. A solution of alum is made by dissolving the alum in sufficient water, and then plaster of Paris is put right into the vessel containing the liquid. It is then so mixed that the solution reaches all portions of the plaster. Next, as described, it is baked. You will find on page 369 of the same issue of the SCIENTIFIC AMERICAN a similar process for hardening plaster. 2. Can you also give some composition for imitating bronze on plaster cast? A. The imitation bronze is prepared as follows: To a solution of soda soap in linseed oil, cleared by straining, add a mixture of 4 pints of copper sulphate and 1 pint iron sulphate solution, which precipitates a metallic soap of a peculiar bronze hue; wash with cold water, strain, and dry to powder. In applying it, 3 pounds pure linseed oil are boiled with 12 ounces finely powdered litharge, strain through a coarse canvas cloth and allow to stand until clear; 15 ounces of this 'soap varnish' mixed with 12 ounces metallic soap powder (previously described) and 5 ounces fine white wax are to be melted together at a gentle heat, in a porcelain basin, by means of a water bath, and allowed to remain for a time in a melted state, to expel any moisture that it may contain; it is then applied with a brush to the surface of the plaster previously heated to 200° Fah., being careful to lay it on smoothly and without filling up any small indentations of the plaster design. Place it for a few days in a cool place; and as soon as the smell of the soap varnish has gone off, rub the surface with a linen rag or cotton wool, and variegated with a few streaks of metal powder or shell gold.

(3) M. V. O. writes: A man has been going about here, selling a gold wash; it is a perfectly clear liquid, like water, and the article you wish to gild, be it silver, nickel, or brass, is immersed in this liquid, having a piece of zinc first wrapped around it, remaining in the bath five minutes; after taking out, it is rubbed with a kind of white powder he uses for the purpose, and then washed in pure water, leaving every appearance of gold. Will you inform me what this wash and powder are? A. Metallic surfaces are gilt by rubbing in the following mixture: Chloride of gold dissolved in pure water 36 parts, mixed with a solution of cyanide of potassium (potassium) 60 parts, in pure water, shake well and set by for 15 minutes, then filter. This liquid is thickened with a powder composed of prepared chalk 100 parts, cream of tartar 5 parts. The foregoing can be used without zinc, and yields results identical with the preparation described by you.

(4) J. R. asks how to make diamond ink to write on glass. A. Diamond ink is made from ammonium fluoride dissolved in water and mixed with three times its weight of barium sulphate.

(5) F. W. C. asks the composition of the sizing which is used on the back of glass windows for applying gold leaf. A. Albumen or white of egg is used. Groot's brilliant sizing, made in Chicago, is a preparation considered unsurpassed for this purpose. 2. Is the dark color of oil that has been used on bearings due to some chemical action, or to minute particles of metal being suspended in it? A. The color is due to minute particles of metal suspended in the oil.

(6) C. T. P. asks: What is the easiest and most practical way to manufacture hydrogen peroxide? A. You will find the outlines of the process in general use given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 184, under the title of "Peroxide of Hydrogen." The details are kept secret, and we understand that the commercial manufacture of this substance is a difficult operation. If but a small quantity of the substance is desired, it will be found much more economical to buy it. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 339. 2. What is the best cement to make heavy Manila paper adhere to wood or a planed board? A. A thin solution of glue or a liquid glue will answer your purpose. The latter is readily prepared by softening 10 parts best glue in 100 parts warm water, and then adding slowly 5½ to 6 parts nitric acid, and finally 6 parts powdered lead sulphate. The latter is used in order to impart to it a white color.

(7) J. Y. G.—For the preservation of insects a good plan is to perforate their bodies once or twice with a long pin dipped in a strong solution of corrosive sublimate. If the case containing the specimens is full, or not likely to be disturbed, the insects and

cases are cleaned as thoroughly as possible, and then the insides of the cases are painted over with a brush dipped into a solution of the sublimate. A few pieces of camphor are placed at the bottom of the case, the lid is fixed on, and strips of paper pasted over the crevices. We would recommend you Mr. J. H. Batly's recent work on "Practical Taxidermy and House Decoration," which we can mail for \$1.50.

(8) L. S. asks (1) for a recipe for making an efficient and cheap tooth powder. A.

- Prepared chalk..... 1 ounce.
- Powdered borax..... 1/2 "
- Powdered myrrh..... 1/4 "
- Powdered orris..... 1/4 "

Mix and sift through fine cloth.

2. A recipe for making a good lady's shoe dressing? A. Ivory black in fine powder 1 pound, molasses 1/2 pound, sweet oil 2 ounces, beer and vinegar of each 1 pint. Rub together the first three until the oil be perfectly killed, then add the beer and vinegar. 3. Recipe for making a good roach and vermin destroyer? A. Boil 1 ounce poke root in 1 pint water until the strength is exhausted. Mix the decoction with molasses and spread it on plates in localities infested by vermin. 4. A recipe for making a No. 1 grease eradicator? A. Soft-soap and fuller's earth, of each 1/2 pound, beat well together in a mortar, and form into cakes. The spot first moistened with water is rubbed with the cake and allowed to dry, when it is well rubbed with a little warm water and rinsed or rubbed off clean. 5. A recipe for making a good polishing paste for metals, such as gold, silver, copper, brass, etc.? A. See answer to query 20, in SCIENTIFIC AMERICAN for May 2, 1885.

(9) J. E. Y. asks: 1. What can I cement the edges of writing paper together with, to makethem into pads as printers do? A. A quarter of an ounce crude gutta percha dissolved in carbon disulphide to the consistency of mullage. Apply to the edges of the paper where required. 2. What makes a good cement for metal that is used for holding kerosene? A. Boil 3 parts of resin and 1 of caustic soda in 5 of water. This composition forms a soap which, when mixed with half its weight of plaster of Paris, sets firmly in about three-quarters of an hour.

(10) A. G. A., Jr.—The rate of progress of glaciers, dependent upon various conditions, is no more uniform than that of rivers. It can in no case be correctly estimated except by observations extending over many years. Thus, for instance, the progress of the glacier of the Aar was for a certain period of time 250 feet per annum, and during another period 550 feet per annum. De la Beche gives 200 yards a year as the motion of the Mer de Glace; "400 feet and 40 feet are both given as the rate of motion of the Mer de Glace." If you will consult Tyndall's "The Glaciers of the Alps," you will find in that book the explanation of the entire subject. There is probably no information that is reliable on record concerning the glaciers of Alaska. See also the "Causes of the Motion of Glaciers," SCIENTIFIC AMERICAN SUPPLEMENT, No. 398.

(11) L. K.—There are various plans of making mustard, thus: Soyer's is described as follows: Steep mustard seed in twice its bulk of distilled vinegar for 8 days, grind to a paste and put it into pots, thrusting a red hot poker into each. Moutarde a l'Estragon: Gently dry 1 pound black mustard seed, then powder it fine, and mix it with 2 ounces salt and sufficient tarragon vinegar to make a paste. In a similar way are prepared several other mustards, by employing vinegars flavored with the respective substances, or walnut or mushroom catsup or the liquor of the richer pickles in proportions to suit. Suitable mortars or grinding apparatus can be procured through any jobber in hardware utensils or druggists' sundries, provided only the smallest articles are desired, otherwise they will have to be made specially.

(12) W. S. asks: 1. What is the best thing to use to soften paper or pulp board to render it fit for pressing into useful shapes, so as to retain its form when dried? A. The pulp is soaked in water and then put right into the heating engine, and there mixed up with the stock. 2. Can it be rendered waterproof at the same time, or what is the best method of waterproofing? A. There is no process of so treating paper as to make it entirely waterproof. SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 39 and 96, describe processes for this purpose.

(13) J. W. B. asks the most approved method of bottling extract of herbs, by hand, so as to prevent it becoming sour after a few weeks or months, without using alcohol. The addition of 25 per cent of glycerine can be employed with safety. Otherwise heat the bottles after they are filled by placing them in boiling water and cook; as they cool a vacuum will be formed, so that the air will not come in contact with the herbs at all.

(14) L. S.—You cannot make a good journal box without tin; 2 ounces tin, 1 ounce zinc, to 1 pound of copper makes an excellent box for wear. Antimony and lead make a poor alloy; antimony and tin make a good soft box.

(15) F. K. asks: Why is it that a heavier float, raft, or coal barge will float faster, or farther in a day, or any length of time, than a lighter one, neither being aided by any motive power or sail? A. It is well known that the swiftest part of the current of a river is not at the top, but somewhere between the top and bottom. The deep laden barge catches the swift undercurrent, and floats faster than a shallow barge.

(16) W. B. H. asks for a plating to apply to the reflector of a dark lantern (tin) without removing the reflector from the lantern. A. Apply the following paste with a rag to the tin; it will form a silver coating: Silver nitrate 1 part, cyanide of potassium (poisonous) 3 parts, with water sufficient to form a paste.

(17) F. P. L. R. desires a good prescription to be taken for internal piles, where they are high up; also a good injection to keep in over night, and the amount to be used of the injection. A. Pulverize in a mortar, and mix thoroughly, 1 ounce each of cream of tartar, jalap, senna, flowers of sulphur, and golden seal,

and 1/2 ounce saltpeter. Dose, a teaspoonful three times a day. For external use: Boil some of the inner bark of white oak in water, and strain; evaporate to a thick extract. To 1/2 pint of this extract add 1/2 pint of oil rendered from old strong bacon. Simmer together till mixed, and let cool. Apply with the finger inside the rectum every night and until cured.

(18) R. O. E. L.—Iron pipe is universally used for conveying the brine in cold cellars and for producing cold in brine vats. If kept free from atmospheric influence, it is the best material available. If a machine is to be laid up for a few months, leave the brine in or on the pipes.

(19) U. D. asks: What is the best treatment for catarrh in the throat (post-nasal catarrh)? A. You will find in SCIENTIFIC AMERICAN SUPPLEMENT, No. 262, an article on "Nasal Catarrh," by Dr. F. H. Bosworth, to which we refer you. Dr. Dudley Reynolds, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 84, writes very fully on the character and treatment of catarrh. See also "A Cure for Catarrh," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 216. The best thing to do, however, is to consult some competent physician.

(20) D. C. H.—If a lightning rod has a good ground, the more numerous its connections with the building the better. Insulators are a positive detriment. A lightning rod should be connected with the tin roof, if the building has one, the gutter, the leaders, and all the metal pipes in the house.

(21) W. W. Q. asks: 1. What is the composition used in the porous cups of the Leclanche battery? A. Granulated black oxide of manganese. In some batteries of this class granulated carbon is mixed with the manganese. 2. What is the best battery for silver and gold plating? A. For plating on a small scale use Smee's; for large work use the Bunsen bichromate.

(22) G. L. C. writes: We wish to get a clockwork motor, to pump an organ. Can such a motor be procured? A. We know of no clockwork motor that would be likely to meet your wants. Spring or weight motors are not much used, as it takes more labor to wind the machine than is required to do the work by the direct application of the power. One would have to be specially made for your purpose, which a good mechanic could do according to the situation.

(23) D. A. F. writes: With a center gas light, 6 feet from large mirror, will room be any lighter on account of reflection of light in mirror? A. The light reflected by the mirror will add something to the light of the room, as, if the mirror were not there, more or less of the light would be absorbed by the wall.

(24) S. T. W. writes: I have built a canvas canoe, and I want to cover it with two thicknesses of Manila paper. I want to find a waterproof glue or a composition of pitch and something else to stick the paper to the canvas. A. Use the following: Fuse together equal parts of pitch and gutta percha, and to this add about 2 parts of linseed oil containing 5 parts of litharge. Continue the heat until the ingredients are uniformly commingled. Apply warm.

(25) G. J. S.—For a sand blast the chamber containing the sand should be connected with the pressure pipe and closed tight. The inlet pipe should be at an acute angle with the blast pipe, so that the sand will flow freely into the blast.

(26) X.—The principle governing the pitching of a curved ball is the same for any distance; but when a person gets familiar with the peculiar motion for a given distance, he cannot give the same curve for any other distance without special practice for that distance. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 423, on Base Ball Science.

(27) W. G.—A little salt in the water for hardening files is commonly used. The heat should suit the quality of the steel. The lowest heat at which the file can be hardened is the proper one. This can only be ascertained by trial. Acid does not destroy temper, but is sometimes used to sharpen old files.

(28) E. L. P.—The hard baking japan for iron work is sold by the varnish makers. It is put on with a brush thinly, and baked in an oven at about 260°; 2 coats is generally sufficient. Cannot give the formulae for the best. Better buy it.

(29) F. J. R. asks: What acid is used to bring out the date on old copper pennies? A. By heating copper coins gradually, it is said that the inscription will in almost all cases make its appearance. Coins can be quickly cleaned by immersion in strong nitric acid and immediately washing in water. If very dirty or corroded with verdigris, it is better to give them a rubbing with the following: 1/2 ounce pure potassium bichromate, 1 ounce sulphuric acid, 1 ounce nitric acid. Rub over, wash with water, wipe dry, and polish with rottenstone or chalk.

(30) W. S. desires the best means of fusing or dissolving gum amber so as to make that varnish. A. Six pounds of fine picked, very pale, transparent amber are cautiously heated in an iron pot, and as soon as it becomes semi-liquid, 2 gallons of pale boiled oil, previously made hot, is very gradually stirred in, and the whole thoroughly blended. This operation is one of considerable delicacy, and requires experience and skill. By mixing it with four gallons of turpentine, a varnish is obtained that will work free, will flow well, is durable, and becomes very hard.

(31) H. L. asks: What is considered best for heaves in horses? A. Balsam of fir and balsam of copaiba, four ounces each, and mixed with calcined magnesia sufficiently thick to make it into balls; and give a middling sized ball night and morning for a week or ten days.

(32) E. B. B. asks: 1. Can you give me the percentage of starch and sugar in ale and beer? A. The percentage of sugar contained in ale and beer varies between 2 and 3 per cent. Among a number of analyses made of beer in this city we find the percentage of sugar in one sample to be 2.64, while in another it was only 2.20. 2. Is there any malt liquor which has no

starch or sugar in it? A. Malt liquors by definition are such in which the grain has become sweet from the conversion of the starch into sugar by an incipient growth or germination artificially produced, called malting.

(33) E. M. K. asks how to work over butter that has become rancid from age and oiling. A. Rancid butter may be restored, or in all cases greatly improved, by melting it in a water bath with some fresh burnt and coarsely powdered animal charcoal (which has been thoroughly freed from dust by sifting), and straining it through clean flannel. A better and less troublesome method is to well wash the butter first with some good new milk, and next with cold spring water. Butyric acid, on the presence of which rancidity depends, is freely soluble in fresh milk.

(34) A. A. S. asks how to make or where to get the kind of black crayons used by rapid crayon artists on the stage. A. The crayons consist of ordinary charcoal, and can be purchased from any house dealing in artists' materials. 2. How luminous paint is made from phosphorus. A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 249. See also Balmain's Luminous Paint, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 229.

(35) R. E. M. B. writes: 1. I want a good waterproof varnish for fine fishing rods. A. Let 4 ounces India rubber in small pieces soften in 8 ounces of oil of turpentine, then add 2 pounds of boiled oil, and boil for two hours over a slow fire. When dissolved, add 6 pounds of boiled linseed oil and 1 pound of litharge, and boil until an even liquid is obtained. To be applied warm. 2. What preparation will best polish German silver trimmings on a rod, and prevent their turning brassy looking? A. Use the polishing paste described in answer to query 20, in SCIENTIFIC AMERICAN for May, 2, 1885.

(36) V. J. T. asks: How can I make the color stay in a meerschaum pipe, so it will not come out in white spots when it gets hot? A. A raw meerschaum pipe would not acquire the rich color which is the smoker's delight, for the oil of tobacco absorbed by the pipe would penetrate the bowl and evaporate. Accordingly, the pipe is boiled in a preparation of wax, which is absorbed, and a thin coating of wax is held on the surface of the pipe and made to take a high polish. Under the wax is retained the oil of tobacco, which is absorbed by the pipe, and its hue grows darker in proportion to the tobacco used. A meerschaum pipe at first should be smoked very slowly, and before a second bowlful is lighted the pipe should cool off. This is to keep the wax as far up on the bowl as possible, and rapid smoking will overheat it, driving the wax off and leaving the pipe dry and raw. It is probable that the wax referred to in the foregoing has been burnt away in your pipe, and hence the white spots.

(37) W. P. H. asks: How many cubic feet for air chamber of compressed air will be required to make one horse power for one hour duration, without adding to the stored amount of compressed air in the air chamber, at the time of starting the engine, the speed of engine to remain the same through the time specified? A. For 1 hour's work equal to 1 horse power, you will require, for the operation of the engine and necessary leakages, 450 cubic feet of air per hour at 30 pounds pressure. You will require storage for 675 cubic feet at 60 pounds pressure to start with, which will run your engine for 1 hour, leaving 30 pounds pressure in the tank at the end of the hour's work. 2. What is the cost of compressed air per horse power? A. It costs more to compress air for power, if done by steam, than the value of the derived air power, by a very large percentage.

(38) B. G. C. asks if a person standing on the bow of a vessel should jump in an opposite direction to that in which the vessel is moving, would the said person make a longer jump than he would if the vessel was stationary? A. No.

(39) L. C. F. writes: I have a three wheeled Sheffield velocipede hand car which I have occasion to use almost continually. Could the car be propelled by a small steam engine or an electric motor, and the car still be readily put on and off track by one person? Present weight of car is some 150 pounds, and light running therefore would not require much power to run it. A. We know of no motor that you could apply to your hand car without adding so much weight as to render it impossible for one person to handle it. There are steam engines in the market which would readily drive it, but they would weigh perhaps 300 pounds, besides the water and fuel. You will find an electric motor very expensive and troublesome.

(40) W. F. asks the best kind of oil to put on engines, lathes, and other kinds of machinery, highly polished, to keep it looking bright all the time. A. We know of nothing better than good cylinder oil melted with leaf tallow, about equal parts; rub the bright parts with the mixture on a rag, leaving but very little oil on the surface. To keep the work looking well and clean, it should be wiped at least twice a week. The dust that lodges upon the surface of oiled work makes it appear dirty. You cannot keep machinery clean without work.

(41) E. A. writes: I have shaft with 2-8 foot wheels, one on each end of shaft, fastened to run on straight track parallel; another, wheel, 15 inches in diameter, is fastened in center of same shaft, with central rail raised up to the center wheel. In moving, does the center wheel slip or not on center rail? Also, a box car moving on a short curve, does the inside or outside wheel do the sliding? A. The small wheel will slide along the center rail if the pressure of the three wheels is alike on the three rails. There is a possibility of the large wheels slipping with a preponderance of pressure on the center wheel. The slipping of wheels does not admit of a positively theoretical answer, but an inspection of the rails at a curve should decide the question practically. The rail that has the greatest slip will be found to be worn and abraded.

(42) F. P. (Mexico) writes: Our cotton, as taken from the field before ginning, is stowed away in a large warehouse, and perhaps remains there some six weeks. We find it liable to heat, which makes the color brown, besides the great danger from fire. How

can I ventilate a room full of unginning cotton? A. For preventing the heating of unginning cotton in warehouse, make the floor open and raised above the ground, so that there should be a free circulation of air under the floor and through the open floor to the cotton. The strips for such a floor may be 1 1/2 inches thick and 2 inches wide, laid 3/4 inch apart. If a floor is already laid solid, and it is not desirable to alter it, a lattice or open floor may be laid over the solid floor by laying strips 3x4 in. on edge, so there shall be continuous passage for air between them clear across the building, and on these strips lay the open floor. Make openings on opposite sides of the warehouse for every passage.

(43) E. M. D. asks: What is the liquid composed of that barbers use for shampooing? A. Dissolve 1 ounce potassium carbonate (salts of tartar) in 1 quart soft water; sprinkle freely on the head, and rub well till a lather is formed; wash off with clean water.

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

B. F. W.—No. 1 consists of iron and copper sulphides, and has the appearance of being a furnace product. No. 2 is a piece of spiegeleisen, a variety of pig iron containing manganese. They have no direct value.—M. C. H.—The powder contains iron and sulphur. Apparently it is the mineral copiapite. To positively determine what it is and its value would require a quantitative analysis. This would cost you \$12.00.

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