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 ripeners 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 bevel 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 Carrollton, Ala. 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 tighten 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, with means to balance and stay chains 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. Athanase 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.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special 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 (poisonous) 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