ENGINEERING INVENTIONS.

A car coupling has been patented by Mr. Salathiel T. Northcutt of Brooks, Oregon. This invention provides an interchangeable link and hook, with special devices to control the working parts of a coupling, from the top of the car or from the ground on either side, to secure it against coupling automatically, or to set the coupling to couple automatically.

A spark arrester has been patented by Mr. James A. Stout, of Belleville, Ill. This invention covers special combinations of parts, including an inner uptake and water receptacle, an outer pipe or duct arranged to produce a down draught into and up through the water receptacle, a hinged or raising and lowering screen cover at top of the outer pipe, and inner spark deflector arranged to move up and down with it.

MECHANICAL INVENTIONS.

A knitting machine has been patented by Mr. Isaac W. Lamb, of Parshallville, Mich. This invention relates to machines in which the needles are placed in two rows opposite each other in planes at angles of about forty-five degrees with the horizon, and its object is to economize the construction and increase the facility of operating the machine.

AGRICULTURAL INVENTIONS.

A rotary cultivator has been patented by Mr. Thomas B. Nutting, of Morristown, N. J. It is constructed with dish-shaped disks attached to shafts inclined from each other and journaled to frames, so when the machine is drawn forward between two rows of plants the disks will be revolved by the resistance of the soil, and cut up and destroy the grass and weeds while moving the soil to and around the plants.

A fertilizer distributing attachment for carts has been patented by Mr. John A. Mitchener, of Selma, N. C. The cart or vehicle body has a hopper arranged therein, with extensions at the upper end to fold down thereon, and beneath the discharge opening in the bottom of the cart body is a spout to receive the fertilizer and conduct it to the ground, the whole being designed for the distribution of fertilizers automatically as the cart is driven over a field.

MISCELLANEOUS INVENTIONS.

A miner's implement has been patented by Mr. Isaac A. Martin, of Ouray, Col. The invention covers a combination tool to be used for cutting fuses, setting caps, and digging holes in powder charges or giant powder candles.

A catarrh remedy has been patented by Mr. Rufus H. Scott, of Centralia, Ill. It consists of chloroform, camphor, chloral hydrate, glycerine, and carbolic acid, in specified proportions, and to be mixed and used in a certain described manner.

A curry comb has been patented by Mr. David B. Weightman, of Grand Rapids, Mich. The body and handle are of peculiar shape, so that, besides the teeth of the comb, a metal or rubber-faced blade may be used for rubbing down horses and stock.

A washboard has been patented by Messrs. Henry Luther and Justus P. Luther, of Berlin, Wis. This invention is designed to provide more substantial washboards than those heretofore made, and with different forms of corrugations on the different sides of the board for different kinds of fabrics.

A combined glove stretcher and measure has been patented by Mr. Augustus Traver, of New York city. It combines a fixed clip and a sliding clip, between which clips the hand is placed for measuring, with a glove stretcher on which a glove measure or scale is fixed, and provides especially for measuring the hand across the knuckles.

A necktie fastening has been patented by Mr. Gibbard R. Hughes, of London, Middlesex Co., England. The invention consists of a piece of sheet metal cut and bent into a special form, and is one of a class of devices used instead of button holes or loops to attach one article of clothing to another by means of buttons or studs.

A paper barrel has been patented by Mr. James Cosgrove, of Flatbush, N. Y. The shell is made in one piece, with flaring slits in its side edges to give a taper to the end parts, shoulders in these edges to form seats for the heads, and the shell and heads being fastened together by hoops applied in the ordinary manner.

A spring clasp for horse collars has been patented by Mr. Stephen E. Burghdorf, of Geneva, N. Y. This invention provides a special combination and arrangement of parts forming a practical clasping device to take the place of straps and buckles, so the collar may be easily put on and removed, and is simple and inexpensive.

A wheat cleaner has been patented by Mr. Solomon Bernheisel, of Green Park, Pa. A cylinder and shell are made to revolve in the same direction, one faster than the other, both sides of the kernel of grain being acted on at the same time, the drum being armed with yielding brushes to effect a more thorough scouring than any rigid fixtures would effect.

A necktie has been patented by Mr. Edwin D. Smith, of New York city. A shield is made of sheet metal, hard rubber, or similar material, with wings on its rear surface for securing the fabric, and a pivoted tongue or latch for locking the shield on the collar button, ribbons or bands of fabric being secured to the shield in such manner as to expose part of the front.

A tension for corn planter check wires has been patented by Mr. William E. Rawlings, of Lynnville, Ill. It is made with a stock having a longitudinal perforation with a spring, a sliding bar with a recess and anchor wire, a sliding bar with forked hook to receive the check wire, teeth to engage with a catch plate, and an operating cord and guide pulley, so the check wire can be put under uniform tension.

An anchor support and tripper has been patented by Mr. Rufus P. Trefry, of Bridgewater, Nova Scotia. It is an instrument to fasten to the rail of a vessel to hold the fluke of an anchor, and so it may conveniently be thrown from the rail as required, the stock of the anchor coming against the hull of the vessel when the fluke is on the rail; it is a simple and inexpensive device, which may be used with any anchor.

A needle cabinet has been patented by Mr. Thomas H. Harper, of Redditch, Worcester County, England. It is divided into compartments, with a slide on the bottom of each, the slide having a longitudinal recess and a slot in its bottom, through which a pin or screw is passed into the bottom of the compartment, the invention being an improvement on a former patented invention of the same inventor.

A saw has been patented by Mr. Jasper L. Purple, of Owego, N. Y. It has a longitudinal slot at right angles to the straight inner edge of the handle, through which slot a set screw passes, which can be adapted to any desired angle, one edge of the slot having a graduated angle scale, while the lower inner corner edge of the handle is adapted to serve as a rest for a straight edge, rule, or similar instrument.

A ditching machine has been patented by Mr. Samuel P. Mason, of New Vienna, Ohio. The object of the invention is to facilitate the opening of tile ditches, and promote convenience in controlling and regulating ditching machines, the cutters and shares being so constructed that they can be adjusted to work at any desired depth in the ground, and readily raised and lowered to regulate the grade of the ditch.

A mechanical movement has been patented by Messrs. James K. Lowe, George M. Westgate, and John Banks, of Logan City, Arizona Territory. The invention relates to the "trammel" or slotted disk movement for converting rotary into reciprocating motion, and consists principally in such construction of the disk that a small ball or circular plate may be used for bridging the cross heads across the slots.

A device for converting motion has been patented by Mr. George H. Caughrean, of Raymore, Mo. Combined with a shaft are two clutch disks, mounted rigidly thereon, with two clutch pulleys loose between the disks, cables or ropes being wound in reverse directions on the pulleys, the ends of the ropes secured in end pieces of a sliding frame, so when the frame is reciprocated the shaft is revolved from the clutch pulleys, which act on the clutch disks on the shaft.

A windmill has been patented by Messrs. George W. Orcutt and James A. Wood, of Los Angeles, Cal. The principal object of the invention is to make a mill which shall be self-regulating against variations of centrifugal force and wind pressure, the wind striking the concave faces of the fans, causing the wheel to revolve, and when the wheel reaches a certain limit the centrifugal force acting to close the fans independently of the action of the wind thereon.

An elevator has been patented by Mr. Walter L. Folstead, of Richmond, Va. It is for carrying persons or merchandise, and provides means whereby a series of cars attached to an endless chain or belt may be adapted to carry loads both up and down at the same time; also means for connecting and disconnecting with a continuously running power to stop the elevator at will, to hold it, and to work it temporarily by hand power when machine power may not be available.

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 CORRESPONDETS.

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) H. J. C. asks for an effective way of taking grease spots out of ground glass. A. Use a concentrated solution of caustic alkali or pearl ash. Ammonia or even alcohol may perhaps be sufficient.

(2) F. S.—China blue, or royal smalts, is the crude oxide of cobalt, sometimes called zaffer, ground with an equal weight of potash and about eight times its weight of feldspar, the mixture submitted to fusion in a crucible, and when cold reduced to an impalpable powder. Used to paint pottery, and also as a blue pigment.

(3) C. A. S. asks how to make bay rum strong, same as barbers charge five cents extra for. A. Saturate a 4 ounce block of magnesium carbonate with oil of bay; pulverize the magnesium carbonate, place it on a filter, and pour water through it until the desired quantity is obtained, then add alcohol. The quantity of water and alcohol depends on the desired strength and quality of the bay rum.

(4) J. H. asks how the plumbago used in the manufacture of lead pencils is hardened or made into a hard form. A. The plumbago is mixed with clay in various proportions according to the hardness required, and baked.

(5) J. E. K. writes: I have a small propeller engine which I have made to go into a small boat; the engine is 1⅛ inches, and I would like your idea of a boiler, and the mode of heating the same. A. Your boiler should have about 16 or 18 feet heating surface. Use anthracite (chestnut) coal or clean coke.

(6) T. H. writes: In firing a cannon ball against a board fence, which is through the first—the ball or the hole? A. When the largest part of the ball has passed through the fence, the hole is complete, and this would occur before all of the ball had passed through the fence.

(7) T. V. H. asks for a recipe for transparent paints that can be used for coloring glass, red and green being the colors. A. Many of the aniline colors are soluble in alcohol, with which varnishes are prepared, so that by dissolving a little aniline of the desired shade with the varnish, and using it very thin, we should think that you could accomplish your object.

(8) C. W. S. asks what ingredients are used to make the blackest of writing fluid, without fading away afterward, on white paper. A. The following ink is probably the most durable:

Bruised galls	4 parts	or 40 lb.
Gum	1 "	or 10 lb.
Iron sulphate	1 "	or 9 lb.
Soft water	45 "	or 45 gals.

Macerate for three weeks, employing frequent agitation. Also see the recipes given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 157.

(9) J. McK. asks the amount of pure starch per bushel ordinary corn will yield, also a few notes on its general manufacture. A. The flat yellow American maize contains 53·50 per cent of starch, while the flat, white, and round yellow varieties contain about 54·75 per cent. For further details we must refer you to Van Wagner's Practical Treatise on the Manufacture of Starch Glucose, Starch Sugar, and Dextrine, $3.50.

(10) J. C. writes: I have a steam launch 22 feet long, 5·3 beam, 2·0 draught, 4 horse boiler, engine 4x5 inches stroke, 250 revolutions per minute, 100 pounds of steam. (1) Give me diameter and pitch of screw. A. Screw 28 inches diameter and 39 inches pitch, 3 blades. 2. What speed can I expect? A. Seven and a half to eight miles per hour. 3. Now, I want to use salt water in boiler; give me some good reasons for not using. A. You will necessarily have a tubular boiler, which it is troublesome to clean. Salt water will rapidly deposit lime and salt (except blowing off is resorted to, which is not economical), which you will be unable to get off, and the result, a burned boiler. 4. Which is best—a donkey pump or an injector as a boiler feeder? Steam valve to engine is a ¾ globe valve. I only open it one-sixth of a turn, and have repeatedly made 8 miles per hour. I must have a screw proportionate to power of engine. A. An injector is most economical, but is very sensitive and requires great care. We should think in your case a donkey pump preferable.

(11) W. S. & Co., write: 1. We inclose you a copy of analysis of chalybeate water on our place, and would like to know what effect it would have on our steam boilers. A. Probably the chalybeate water may be safely used in steam boilers, but the question had better be submitted to a good chemist. 2. Would it be better than our river water, which is composed principally of limestone water, and gets muddy every time it rains hard? A. The river water when muddy might be filtered; the lime might be disposed of in a great degree, by passing the water through a suitable heater before it enters the boiler.

(12) Subscriber writes: You recommended, for ebonizing wood, to pour two quarts boiling water over one ounce powdered extract of logwood, and when solution effected, add one drachm yellow chromate of potassium. I tried your recipe, but without success. Is not the proportion of water much too great as compared to the other ingredients? A. To ebonize wood, take 4 ounces shellac, 2 ounces borax, and ¼ gallon water, boil until dissolved, then add ¼ ounce glycerine. To this mixture add sufficient of the water-soluble aniline black.

(13) E. B. F. desires a recipe for a cement that will join together the parts of a fancy iron stand. A. Fuse together equal parts of gutta percha and pitch; use hot. A stronger cement consists of ammonium chloride (sal ammoniac), 2 ounces; flowers of sulphur, 1 ounce; iron filings or borings, 5 pounds to 12 pounds; with sufficient water to mix.

(14) R. P. P. asks the ingredients for making the "gilding compound" which is sold in the stores. There are two bottles, one containing the liquid and the other the powder. A. The powder is gold bronze or brass ground up very fine, and the liquid common size diluted. The London gold paint, is one of the best qualities used, and comes in sixteen shades. You will find it more satisfactory to purchase the article than to make it.

(15) J. W. W. asks (1) as to the best method or process of preparing, sensitizing, and fixing ordinary plain paper for printing from a negative in black on a dead white ground. A. Dip the paper into a solution of ammonium chloride, then float on a silver bath, which will form silver chloride. 2. How to make liquid tin foil if it is possible, in other words, a cold metallic liquid that will set or harden in half an hour or less, after being poured out or used? A. A silvering solution of mercury is the only article that seems to cover your wants.

(16) R. H. M. asks what is the highest degree of heat at which water can successfully be pumped from a well, fourteen feet deep, by an ordinary double acting piston pump. A. This depends entirely upon the position of the pump chamber. If the pump is at the bottom of the well, so that the water will flow freely to the pump chamber, boiling water may be pumped. If it is above the water 2 or 3 feet, 170° is about the limit. If the pump is 14 feet above the water, you cannot rely upon service with the water above 150°.

(17) C. E. B.—You will find in Notes and Queries in recent issues of the SCIENTIFIC AMERICAN, full information on plating cutlery with white metal. The alloy used is block tin with a small percentage of antimony added. The articles must be cleaned from all grease by means of a solution of caustic potash; they should then be scoured with washed emery, and thoroughly washed; they should then be rubbed over with soldering fluid, and dipped into the melted metal. To prevent oxidation of the surface of the metal, it should be covered with wax or tallow. For full information on electro-plating, consult SUPPLEMENT, No. 310.