ENGINEERING INVENTIONS.

A car coupling has been patented by Messrs. Jacob W. Baker and George A. Prescott, of Dover, N. J. This invention relates to the construction of a novel form of drawbar and connections, to be used with the ordinary form of coupling link.

A boiler feed regulator has been patented by Mr. Charles O. Wyman, of Anoka, Minn. The invention consists of a tank with pipes connecting it with the boiler above and below the water line of the latter, and with pipes leading to the pump, with various novel features, to keep the water at all times at the proper height.

A reversing mechanism for engines has been patented by Mr. Lorin C. Forwood, of Shipman, Ill. It consists in an eccentric held between collars secured to the main shaft of the engine, with sliding wedges arranged to move the eccentric transversely across the shaft, by which the reversing of the valve motion is effected, without the ordinary joints and rods required where links are used.

An automatic water feeder for steam boilers has been patented by Mr. Charles O. Rabut, of New York city. It embraces a system of valves operated by a float controlled by auxiliary floats, and also in an arrangement of an air valve to permit the escape of air during the filling of the float chamber, all of the working parts being inclosed by a casing, except when registering mechanism is employed.

A valve for hydraulic elevators has been patented by Mr. Parker F. Morey, of Portland, Oregon. This invention comprises a system of differential valves controlled by an auxiliary valve, and thus governing both the admission and the escape of water from the ram of the elevator, with provision for arresting the motion of the ram, as required, to stop the elevator, the design being also to prevent excessive wear from sand or grit.

MECHANICAL INVENTION.

A machine for making whiffletree bolt blanks has been patented by Mr. John Stacker, of Winsted, Conn. In this machine a new form of anvil or die is employed, on which the heads of the bolt blanks are flattened, split, and spread or opened, in connection with a new device for splitting and opening the bolt, so that all the operations may be conducted with dispatch on the same machine.

AGRICULTURAL INVENTIONS.

A combined corn planter and cultivator has been patented by Mr. John C. Weiss, of Sheldon, Mo. The object of this invention is to improve the construction of a machine heretofore patented, involving novel features and combinations, to render the machine more convenient in use and more reliable in operation.

A harvester for sugar cane, corn, etc., has been patented by Mr. Samuel H. Pearcy, of Franklin, Tenn. This invention covers a novel construction and combination of parts in a machine to be drawn by teams on fields of standing crop, and automatically cut the standing canes and strip them of their tops and leaves, and drop them in bunches while passing along the cane rows.

MISCELLANEOUS INVENTIONS.

A rein muff has been patented by Sarah J. Hull, of Stella, Neb. One end has a flap secured to one side and constructed to be folded over the end and secured to the opposite side, so that the reins and whip may be held in the hands and the latter be at the same time protected by the muff.

A carpet stretcher and tacker has been patented by Messrs. Adelbert H. Noyes, of Jefferson, and Frederick G. Noyes, of White Water, Wis. It has a staff and barrel, to the lower end of which is attached a toothed carpet stretching and holding head, in connection with a tack holding tube, and a foot pedal so arranged that the tacks may be driven thereby.

A mould for soles and heels of boots or shoes has been patented by Mr. Darius Banks, of Morrisville, Pa. It is for forming the heel and sole together of rubber or other plastic material, by simply pressing the latter into the mould by hand and permitting it to harden, the form being shaped and withdrawn from the mould in a manner not attainable with a solid mould.

A clevis has been patented by Mr. Arthur W. Rumsey, of New Kiowa, Kan. It is more especially designed for attachment to agricultural implements or machines, and provides a simple, inexpensive, and effective device, which may be quickly and easily coupled or uncoupled, but which will not uncouple accidentally.

A moulding machine has been patented by Mr. Samuel C. Burris, of Victoria, British Columbia. It has upper and lower cutter heads for simultaneously surfacing and grooving opposite sides of timber, with cutters arranged at an angle to the line of motion of the timber, and other novel features, to improve the construction of woodworking machines.

A miner's safety lamp has been patented by Mr. August J. Becker, of Mount Carmel, Pa. The invention consists of various parts and details, making a lamp which cannot be opened by the operator without extinguishing the light, and in which the light is extinguished when brought into contact with the fire damp.

A facing tool has been patented by Mr. Alfred H Donnally, of Foxburg, Pa. The invention consists of a face plate carrying cutters and having ratchet teeth, a ratchet lever and pawl operating on the face plate, and there being a feeding device for the face plate, the tool being specially adapted for truing up the faces of oil well joints.

A combination ladder has been patented by Mr. Christian Koerner, of Rochester, N. Y. It is a step ladder connected with an auxiliary section by separable hinges, the auxiliary section having one or two additional sections, and one of the sections having a short ladder acting in conjunction with the section to form a trestle for supporting a stage.

An ax has been patented by Mr. Nicholas Goodier, of Dardanelle, Ark. The ax body has a transverse groove, and a deeper slot at right angles thereto, to receive a corresponding tongue and projection on a detachable bit, the parts being rigidly united by a bolt passing through the projection, so the cutting blade is detachable and can be renewed when worn or destroyed.

An adjustable balcony has been patented by Mr. Gottlieb D. Husemann, of St. Louis, Mo. This invention covers a novel construction of folding balcony, which can be readily removed and folded in small space for storage, especially designed in washing the outside of windows, being so constructed that it can be easily adjusted in operative position in any window of any story.

A bicycle handle has been patented by Mr. Robert Rodes, Jr., of Nashville, Tenn. Combined with the bicycle handles are curved levers pivoted thereto, having hooks on their shorter arms, which are received in holes formed in the under side of the cross arm, to which the handles are jointed, the invention being an improvement on a former patented invention of the same inventor.

A dumbwaiter has been patented by Mr. James Murtaugh, of New York city. It consists of two counterbalanced carriages arranged in the same shaft, one above the other, each having means for operating it independently of the other, thus making a waiter in which the upper carriage can be conveniently used for the upper and the lower carriage for the lower floors of a building.

A bag fastener and tag holder has been patented by Mr. Austin Leyden, of Atlanta, Ga. It has a plate with a hook or hooks, over which a tightened bag cord may be drawn, a plate with a slot to receive the cord, an adjustable latch bar, and other novel features, being especially adapted for use on mail bags of the second class and on bags containing general merchandise.

A feeding mechanism for grain, flour, etc., has been patented by Mr. Charles A. Andrus, of La Grange, O. It is a mechanism which secures a positive discharge from the bin, subject to regulation as to the amount of material passed out of the receptacle, and applicable to a large range of work, from the natural grain to the softest stock, which is fed so that it cannot sift or dust and waste.

An inhaling device has been patented by Mr. Marmaduke W. Hobbs, of Richmond, Ind. It is an inhaler or respirator in which an adjustable disk or valve is employed for regulating the admission of air into the instrument when in use, and for closing one of the air openings when not in use, there being shallow trays for holding the substances to be inhaled, and a removable air induction tube.

A window cleaner has been patented by Mr. Carl B. Von Schenk, of Frankfort-on-the-Main, Germany. The invention consists of a pad attached to a bracket secured to a block, with a powder holder secured to the bracket, and a detachable pad, being designed to clean and polish windows, looking glasses, etc., without the use of water, the specially described powder consisting of silicic acid, magnesia, aluminum, and sulphuret of calcium, prepared as set forth.

A piano forte damper cover has been patented by Mr. Emil Hofinghoff, of Barmen, Prussia, Germany. It is fastened to the back or to the bottom of a grand piano, and is hinged to the instrument so that it can be conveniently opened or closed by hand, and fixed to any desirable amount of opening, being designed to facilitate controlling the power and to improve the tone of the instrument, and also to guard against hurtful influences of temperature and dampness.

NEW BOOKS AND PUBLICATIONS.

ELECTRICITY IN THE SERVICE OF MAN. From the German of Dr. Alfred R. Von Urbanitzky. Edited by R. Wormell. 859 pp. London and New York: Cassell & Company.

This is a very comprehensive popular, and practical treatise on the application of electricity in modern life, referring to and describing, with numerous illustrations, a large proportion of the hitherto published experiments and investigations in nearly all branches of electrical development. Part I. treats of the principles of electrical science, and Part II. of its technology, including generation and conduction, the electric light (noticing all the different systems that have attained any degree of success), electro-chemistry and metallurgy, electricity as a motive power, the telephone and the telegraph.

STEAM ENGINE CATECHISM. Part II. By Robert Grimshaw. New York: John Wiley & Sons.

This little volume, really issued as a supplement to a former brief catechism of the same author, is a continuation of the same style of giving information in regard to steam engine practice, through the form of question and answer.

PRECIOUS STONES IN NATURE, ART, AND LITERATURE. By S. M. Burnham. Boston: Bradley Whidden.

The author has put together in this volume 400 pages of very readable matter touching precious stones and their imitations, as a sort of supplement to his former work on "Limestones and Marbles," published in 1883. The chapters relative to collections of precious stones, crown jewels, and prices, trade, pawns, etc., engraving on stones, and their secular and sacred uses, are full of interesting anecdote and detail drawn from a wide field of investigation. Nearly one hundred pages are devoted to the diamond alone, and the appendix has tables of sizes of remarkable diamonds, and the relative hardness, specific gravity, and principal constituents of precious stones. The book has a full index.

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Minerals sent for examination should be distinctly marked or labeled.

(1) J. F. P. asks if a diamond will give light in the dark. A. No; unless by phosphorescence after exposure to sunlight or the electric arc light.

(2) B. D. asks how to preserve some mole skins without injuring the fur—an easy method. A. Supposing the skins are dry, they should be softened throughout by soaking in pure water; soft water is best, but any ordinarily pure water may be used, and care must be taken that the skins are thus soaked only a sufficient time to soften them. Then clean off any bits of flesh that may remain on the flesh side, rinse all well,

shake off the loose water, and gently stretch out and tack on a board, flesh side up. Then sprinkle with a mixture of powdered alum and salt, about two-thirds alum and one-third salt, enough to just cover every part. As the skin dries it takes up the mixture, but if any be left on the surface the second day, sprinkle on a little more water, otherwise put on more alum and salt, and sprinkle. Two to three days should be sufficient for such small skins, the idea being to give the skin all of the alum and salt it will take up, while in a moist condition. This tawing process makes the hair firm, a gentle rubbing and beating softens the flesh side, and it is preserved from decay, although tawed skins are never calculated to stand much wetting. This process is well adapted for all small skins, although those which are heavier require more time, and the flesh sides are sometimes folded together, and the skins rolled up. When the skins are freshly taken off, no soaking is needed, but more care is then called for in thoroughly washing off and cleaning them, and the first application of salt and alum should be in the proportions of one-half each. It requires the judgment of a tanner to deal with skins in a dry state which may have become partly damaged before drying, and it requires special knowledge also to tell whether a dry skin is so damaged.

(3) A. T. G. asks what is the process of fastening rubber rolls on clothes wringer. A. Clean shaft thoroughly between the shoulders or washers, where the rubber goes on. 2. Give the shaft a coat of copal varnish, between the shoulders, and let it dry. 3. Give shaft coat of varnish and wind shaft tightly as possible with five ply jute twine at once, while varnish is green, and let it dry for about six hours. 4. Give shaft over the twine a coat of rubber cement, and let it dry for about six hours. 5. Give shaft over the twine a second coat of rubber cement, and let it dry for about six hours. 6. Remove washer on the short end of shaft, also the cogwheel if the shaft has cogs on both ends. 7. See that the rubber rolls are always longer than the space between the washers where the rubber goes on, as they shrink or take up a little in putting on the shaft. 8. Clean out the hole or inside of roll with benzine, using a small brush or swab. 9. Put the thimble or pointer on the end of shaft that the washer has been removed from, and give shaft over the twine and thimble another coat of cement, and stand same upright in a vise. 10. Give the inside or hole of roll a coat of cement with a small rod or stick. 11. Pull or force the roll on the shaft as quickly as possible with a jerk, then rivet the washer on with a cold chisel. 12. Let roll stand and get dry for two or three days before using same. Cement for use should be so thick that it will run freely; if it gets too thick, thin it with benzine or naphtha.

(4) W. H. H. asks the best known receipt for purifying the best sweet oil sufficiently for watch oil. A. Put thin sheet lead into olive oil in a bottle, expose it to the sun for a few weeks, and pour off the clear liquid.

(5) J. R. S. asks (1) the composition of a cheap paint suitable for rough work. A. Grind powdered charcoal, oxide of iron, or any convenient pigment in linseed oil with sufficient litharge as drier, and thin for use with well boiled linseed oil. You will find it, however, cheaper to purchase a ready made paint from some reputable dealer. 2. A good work on the manufacture of paper from wood. A. See "Technology of Paper Trade," in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 109, 110, 116, 117, 118, and 123.

(6) A. R. H. asks the receipt for making the Sozodont tooth powder. A. Take of potassium carbonate ½ ounce, honey 4 ounces, alcohol 2 ounces, water 10 ounces, oil wintergreen and oil rose sufficient to flavor. 2. A good stove polish. A. Take of black lead pulverized 1 pound, turpentine 1 gill, water 1 gill, sugar 1 ounce.

(7) S. G. asks: Is there any way to mark white dishes permanently? A. We know of no means except by grinding suitable pigments in proper vehicle, painting the china, and then burning it in.

(8) L. S. B. desires a receipt for making a good black lacquer. A. Take of burnt umber 8 ounces, true asphaltum 3 or 4 ounces, boiled linseed oil 1 gallon; grind the umber with a little of the oil; add it to the asphaltum, previously dissolved in a small quantity of the oil by heat; mix, add the remainder of the oil, boil, cool, and thin with a sufficient quantity of oil of turpentine.

(9) D. W. McD. asks how to restore rancid butter so that it will taste and smell well. A. Wash well first with some good new milk, and next with cold spring water.

(10) A. H. W. writes: I want to have twelve triangles made from bar steel, each one to be of a different tone from the other. What sizes should each be, and what sizes of steel should each be made of, to make the best sounds? A. As you cannot depend upon getting steel of small and exact variations in size, your only course is to make a trial of a bar, and make a second trial with a shorter bar for the next note. Then make a trial on the next size steel. Commercial steel varies enough from its normal size to prevent any computation of lengths for chimes or chords or single notes.

(11) W. H. R. asks: 1. How can I construct a simple hygrometer to ascertain the moisture of a room when steam vapor is used? A. You may make a very good hygrometer by hanging a piece of well twisted catgut, that has not been oiled, to a hook with a disk or pointer attached to the lower end just heavy enough to straighten the catgut, using an eye of wire to keep it from swinging. The whole may be fastened to a small strip of wood, to hang upon the wall. The catgut may be a few inches or a foot or two long, according to the amount of twist. The index will swing with the hygrometric changes, and may be adjusted to proportional parts by comparison with a "Mason's hygrometer." SUPPLEMENTS 571, 334, 14, 379, 155. 2. Give me the best recipe you can for a casehardening compound, to be used on open fires. A. Casehardening in the open fire is a very poor and superficial process. We know of nothing better than a mixture of cyanide of potassium and hoof shavings thoroughly pulverized and mixed. 3. What is the best welding compound for working steel? A. There are a great many welding compounds in use, with as many claims to superiority. We have found nothing better than borax with a little sal ammoniac—about 10 per cent—all pulverized together.

(12) O. A. B. asks for a preparation or composition used to bleach hair. A. Use hydrogen peroxide, a description of which and its method of manufacture is given in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 184 and 239. Wash the hair thoroughly, and when perfectly dry, apply the bleach with a small sponge, rubbing well into the roots of the hair. Use as often as may be necessary to obtain the desired shade.

(13) J. T. C. asks (1) a receipt to bleach sponges. A. Soak in diluted muriatic acid 10 or 12 hours, then wash with water and immerse in a solution of hyposulphite of soda to which a small quantity of diluted muriatic acid has been added, and wash out. 2. How to kill ringworm or barber's itch? A. Wash the part affected with a little lemon juice; then rub in with the finger a little gunpowder which has been bruised in a porcelain mortar. Do this gently about twice a day. Be very careful not to make the skin sore. 3. A good receipt for hair dye? A. Take of silver nitrate 1 ounce, copper nitrate 1 drachm, distilled water 2 ounces. Dissolve the salts in the water, and add water of ammonia to the solution until the liquid becomes of a clear blue color.

(14) M. A. M. writes: I wish to preserve a portion of a polished steel surface and etch or eat away the remainder to a depth sufficient to re eive a thick electro plate of silver, so that when plated, and the plating polished, it will be even with the preserved steel surface, so the whole surface will be even, but a portion steel and a portion silver plated. A. This is what is called electro inlaying, and is only successfully practiced by experts in this style of art. The etching process is the same as for engraving steel plates. The protecting material is asphalt varnish, which may be used with pencil brushes for ornamental work or for stopping off any parts not required to be acted upon by the acid. Asphalt, resin, and beeswax about equal parts, varied for hardness to suit the temperature, is suitable to cover the surface, warmed by dabbing with a small pad. This allows of the figure being scratched in with a point. Nitric acid 1 part, water 2 to 4 parts, is generally used for biting in the figures. This, followed by a dilute muriatic acid dip for removing oxide and cleaning the surface, will probably prepare the piece for electro plating. If not, you will have to make a study of chemicals that will clear the surface so as to take the silver; possibly a few trials cyanide of silver or potasso-cyanide may give you success. For electroplating, see details in SUPPLEMENT, No. 310.

(15) F. S. S. asks whether the last drops of a liquid dropped from a bottle are larger than the first, and why? A. The size of drops depends on the shape of the surface on which they form and on the rapidity of delivery. Hence they may be either larger or smaller when a bottle is nearly empty than when it is full, generally we think larger, because the flat surface of the mouth or lip is then the forming surface.

(16) J. G. asks (1) how to make a good cheap varnish for furniture. A. Melt 120 parts. of yellow wax and a little pulverized resin, and compound this with 60 parts of warm oil of turpentine or spirits of turpentine. Rub the furniture with this by means of a woolen rag. 2. A receipt for cleaning window glass. A. Tie up some finely powdered whiting in a small piece of muslin. Dab it over the glass thoronghly. The dirtier the glass, the more whiting will adhere to it. Next smear it evenly with a damp rag, and let it remain until perfectly dry; then rub it off with a leather.

(17) W. G. S. asks: How is the bisulphide of tin amalgam prepared for frictional electric machines? A. It is not an amalgam. Powdered bisulphide of tin is spread over the greased cushions. An amalgam of one part of zinc, one of tin, and two of mercury is highly recommended.

(18) Lux asks: Is there any solution in which I can soak paper to make it a conductor of electricity when dry, also a method of putting an electrically conductive surface on paper? A. The electrically conducting solutions depend generally on the moisture they retain for their efficacy. For a surface, Dutch leaf or some metallic bronze powder is available.

(19) F. H. asks: 1. Will the micro-telephone, Fig. 5, described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 163, work on telephone described in SUPPLEMENT, No. 142, where no battery is used? A. The micro-telephone requires a battery. 2. Can a telephone made with permanent magnet be used with battery? A. It can. 3. Will it do to make bobbins of permanet magnet telephone of metal instead of wood? A. Metal is quite objectionable, as tending to shield or mask the current effects. Use wood or ebonite.

(20) E. B. asks: 1. Could water be heated to a temperature of twelve hundred degrees, that is, could a boiler be constructed strong enough, and a fire of ordinary coal be made hot enough to produce a temperature of twelve hundred degrees, no steam to be used, but simply to see how hot the water could be made? A. Water could be heated to any temperature short of dissociation. No boiler and fire could be constructed that would stand the pressure. 2. What would be the pressure per square inch on the boiler in above question? A. The pressure would be enormous. If steam space existed, it would be in the neighborhood of three hundred thousand pounds to the square inch (by Weisbach's formula). If it were solid water, the pressure would be still greater. 3. Would a tuning fork vibrate as long under an air pressure of ten atmospheres as it would under a pressure of one atmosphere? A. A tuning fork would vibrate longer in a vacuum than in air, and longer in one atmosphere than in ten.

(21) D. A. B. asks a receipt for dissolving mica, such as is used in stoves? A. Mica cannot be dissolved without complete decomposition. 2. In what way is rubber polished after vulcanizing, in the manufacture of combs and other rubber goods? A. By the ordinary finest grade of polishing powders, such as glass flour, emery, or rotten stone, and the use of cloth buffs or hand appliances to do the work. 3. Is there any method of preparation that can be used for coating plaster of Paris models that will leave the rubber smooth and bright after vulcanizing? A. Oil and blacklead and soapstone powder are recommended as facing for moulds. The SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 249, 251, 252, which we can send you for ten cents apiece, treat the subject exhaustively, more especially the last number.

(22) B. F. R. asks: Can you add any harmless substance to milk that would make a copious and permanent foam on being beaten with an egg beater? A. You might take the following, which is used with soda water: To each gallon add from two to four ounces of gum arabic dissolved in its own weight of water; or use the following: Quillaya bark 4 ounces, alcohol 4 ounces, glycerine 4 ounces, and water 8 ounces. Exhaust by percolation to make 1 pint of tincture. Two to five drachms of this tincture to be used to every gallon of fluid.

(23) G. F. asks why the planet Mercury is so much more flattened at the poles than the earth. A. There is no flattening of the poles of Mercury that has ever been measured, except at its transits, and then it is not observable in common telescopes. What you have probably seen is the gibbous phase due to its position in relation to the sun and earth. This might appear like an extreme flattening in a poor telescope.

(24) C. B. writes: I intend to make a dynamo three times larger than the one described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 161, and wish to know its capacity in furnishing a current for incandescent lamps (without battery). How many lamps of 20 candle power will it run, how many lamps of 24 candle power will it run, and how many lamps of 32 candle power will it run? Also please quote the additional lamps of 20, 24, and 32 candle power it will run with 6 medium sized Bunsen cells additional? A. A dynamo three times the size of that described in SUPPLEMENT, No. 161, would probably not run more than two or three 20 candle lamps. The six Bunsen cells would help it a little if used to charge the field. We do not recommend this dynamo for practical, every day use. We hope soon to describe a larger dynamo.

(25) B. L. R. asks how the ribbons used on writing machines, daters, etc., are made, that is, what material is used for making the different colors, how they are compounded, and how the ribbons are prepared. A. Take vaseline (petrolatum) of high boiling point, melt it on a water bath or slow fire, and incorporate by constant stirring as much lampblack or powdered drop black as it will take up without becoming granular. If the fat remains in excess, the print is liable to have a greasy outline; if the color is in excess, the print will not be clear. Remove the mixture from the fire, and while it is cooling mix equal parts of petroleum, benzine, and rectified oil of turpentine, in which dissolve the fatty ink, introduced in small portions by constant agitation. The volatile solvents should be in such quantity that the fluid ink is of the consistence of fresh oil paint. One secret of success lies in the proper application of the ink to the ribbon. Wind the ribbon on a piece of cardboard, spread on a table several layers of newspaper, then unwind the ribbon in such lengths as may be most convenient, and lay it flat on the paper. Apply the ink, after agitation, by means of a soft brush, and rub it well into the interstices of the ribbon with a tooth brush. Hardly any ink should remain visible on the surface. For colored inks, use Prussian blue, red lead, etc.

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