

ENGINEERING INVENTIONS.

A car coupling has been patented by Mr. Antoine Muller, of Terre Haute, Ind. It has a link adjuster by means of which the link may be held at different angles to enter higher or lower drawheads, and an elevating shaft extending to the sides of the car by which the coupling pin may be lifted.

A cut-off valve has been patented by Messrs. Roland Bentley, of Dresden, and Thomas Ford, of Longton, Stafford County, England. It consists of an equilibrium hollow cylindrical slide valve worked by an eccentric from the main shaft, with cylindrical valves inclosed therein and worked by an eccentric and governors, or otherwise, as an automatic variable cut-off or expansion valve for steam, air, and water engines.

MISCELLANEOUS INVENTIONS.

A bed pan has been patented by Kate M. Duffey, of Astoria, Oregon. The invention covers certain details of construction whereby such a device may be used with as much convenience as possible, and can be readily and thoroughly cleansed.

A trace supporter has been patented by Mr. Alfred Anderson, of Stromsburg, Neb. It is attached to the back pad skirt, and is adjustable thereon to hold the trace high or low, according to the size of the horse or the work to be done, the supporter having no direct connection to the back pad.

A perforator for printing presses has been patented by Messrs. Robert and George Kennedy, of New Westminster, British Columbia, Canada. It has an oscillating bar carrying a series of perforating teeth, and adapted to be supported in the form, in combination with devices for oscillating the bar.

A whiffletree hook has been patented by Mr. Jay C. Davis, of Marshfield, Wis. It consists of a loop having a slot dividing and leading into it, the slot being formed in a line diagonal to the direction of length of the loop, with a supporting plate adapted for connection with the whiffletree or bar.

A nail brush has been patented by Mr. George H. Course, of Baltimore, Md. The rear end of the handle of the brush is provided with a central nail-cleaning projection and guards on opposite sides to protect the nail cleaner from injury, the design giving a very efficient shape to the nail cleaner.

A floating oil distributor for vessels has been patented by Mr. John Ericson, of Sabine Pass, La. It consists of a boat of suitable size to be readily carried upon and secured against the weather side of a vessel in case of storm, to automatically, by the action of the waves, distribute oil upon the waters to calm them.

A barbed fence has been patented by Mr. Orlando Huffman, of Friend, Neb. The cables are formed of two strands, one above another, the barbs projecting in one direction only, downward from the cables, with other novel features, the fence being designed not to injure stock while affording an efficient obstacle to their passage.

A folding chair has been patented by Mr. Hiram F. Henry, of Gowanda, N. Y. It is designed to be light, strong, and inexpensive, folding perfectly flat, and so that a series can be arranged to form a folding settee, the invention covering various novel features, and being an improvement on a former patented invention of the same inventor.

A candlestick has been patented by Messrs. Robert H. Mehl and Robert Knott, of Brooklyn, N. Y. It is designed more particularly for lighting and ornamenting Christmas trees, etc., and consists of a wire bent to form a supporting arm, and near its upper end a loop with a reflector, and a pin wheel pivoted on an extension.

A miter box has been patented by Mr. Charles Lyman, of Clarinda, Iowa. It consists of two hinged boxes having their approaching ends beveled, and their upper faces with a longitudinal groove, with other novel features, being especially adapted for tinners' use in jointing eaves troughs or gutters at an angle.

A vest protector has been patented by Mr. Benjamin Ives, of Chicago, Ill. It consists of an apron having a perforated binding along its upper edge, in combination with S-shaped hooks received in the holes of the binding and adapted to engage the edges of the vest pockets, making a simple and efficient device for protecting garments.

An addition register for pencils has been patented by Mr. Henry C. Rose, of Leadville, Col. This invention relates to that class of addition registers which are mounted upon the end of a pencil, and provided with register wheels and an index hand to indicate the aggregate of several successive additions.

A trunk has been patented by Mr. William J. Large, of Brooklyn, N. Y. To the tray are pivoted the arms of a bent ball-shaped rod, the body in one piece and the two arms at right angles to the body, and adapted to be held in suitable bearings at the back of the trunk, so that in raising and lowering the tray both ends will move together.

A perfumery stand has been patented by Mr. James C. Austin, of Brooklyn, N. Y. It is adapted more especially for holding bottled perfumery for exhibiting it to customers, and is designed to prevent theft, while affording full view of it in an attractive manner, the invention covering various novel features in the construction of the stand.

A reach coupling for vehicles has been patented by Mr. Stephen M. Wier, of New Haven, Conn. Combined with the axle and reach are conical bearings secured to the axle, and conical sockets attached to the reach for receiving the bearings of the axle, thereby providing large adjustable wearing surfaces in which the king bolt is not subjected to wear.

A gate has been patented by Mr. John W. Rutledge, of Shannondale, Ind. It is so constructed

that whether a person approach the gate from one side or the other, by drawing on the operating cord the gate will be opened away from him, and by drawing on the operating cord on the opposite side the gate will be closed and latched.

A mouth piece for pipes has been patented by Mr. Henry C. Rose, of Leadville, Col. It has an attachment formed as a tubular stem with a bulbous end, having an annular opening around the bulb, which allows the smoke to spread and issue in a diffused sheet at right angles to the stem, modifying the effect of the hot current of smoke.

A washing machine has been patented by Mr. Horatio J. Lockhart, of Fostoria, Ohio. This invention relates to washing machines in which the material to be washed is drawn between revolving rollers, one or more of them having a longitudinal reciprocating movement, and covers various novel features in a simple, durable, and easy running machine.

A brick truck has been patented by Mr. James C. Steele, of Statesville, N. C. The invention covers a novel construction and combination of parts in a hand truck especially adapted for transporting short brick hacks, either in the hack or on pallets, without rehandling or rehacking them, the truck being strong, light, and easily handled.

An apparatus for making drills has been patented by Mr. John H. Kane, of Huntington, West Va. It has a pair of grooved rolls, a roll-advancing mechanism, a gauge arranged in connection with the rolls, and a gauge-operating mechanism, being designed to make straight and spiral ground drills cheaply, and of uniform and standard size.

An apparatus for transferring pig iron from its bed has been patented by Mr. William H. Fredericks, of Johnstown, Pa. It consists of a combination of lifting jacks, an elevated track frame mounted upon movable sections of the jacks, and bearing rails upon which wheeled trucks run, with other novel features, for transferring pig iron to the breaker for reducing it to proper lengths.

SCIENTIFIC AMERICAN
BUILDING EDITION.

APRIL NUMBER.—(No. 30.)

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The Holly Manufacturing Co., of Lockport, N. Y., will send their pamphlet, describing water works machinery, and containing reports of tests, on application.

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"The Improved Greene Engine." Flat slide valves, both steam and exhaust. Providence, R. I., Steam Engine Co., sole builders.

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NEW BOOKS AND PUBLICATIONS.

DEFENSE OF THE SEA COAST OF THE UNITED STATES. By Bvt. Brig.-Gen. Henry L. Abbot, U. S. Army. New York: D. Van Nostrand. 1888. Pp. 167.

In this book are contained a series of five lectures delivered by the eminent author before the U. S. Naval War College, in November, 1887. The subject is treated from all aspects, and a very clear idea of the present status of coast defense is presented. Many figures of artillery practice and results add to the value of the treatise. The author's personal views are of course strongly brought out. Thus, his devotion to submarine mines, and his opposition to the pneumatic dynamite gun, which he intimates should be called a mortar, are equally clear. He claims that the last named weapon would be of great injury when used by the defense, as it would interfere with the success of fixed mines, by countermining or exploding them, thus destroying its own defenses. But by the use of ordinary care in its manipulation, it would seem secure from this danger. It is also perfectly clear that the enemy might use the pneumatic gun with great success, as a countermining, so that its uses in war are rather emphasized by this very objection.

L'ELECTRICITÉ: NOTIONS ET APPLICATIONS USUELLES. Par Aug. Michant. Paris: George Carré. 1888. Pp. viii, 410.

This book covers the whole science of electricity and all its applications. Much is necessarily treated in an abridged style, but the whole subject is very well presented. Upward of 300 illustrations, among which we recognize some reproductions from the columns of the SCIENTIFIC AMERICAN, add materially to the interest of the work, as they are generally well chosen and pertinent to the subject.

EASY EXPERIMENTS FOR SCHOOLS AND FAMILIES WITH HOME-MADE APPARATUS. By A. R. Horne, A.M., D.D. Chicago: A. Flanagan. 1886. Pp. 79. Price 35 cents.

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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.

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Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) C. V. A. writes: 1. In our SCIENTIFIC AMERICAN of April 23, 1887, you describe the winding of the armature for an 8 light dynamo machine. Can two layers of wire be substituted for the four layers therein prescribed, making one layer of wire per section instead of two? Of course I would not expect such good results, but would find it much easier to construct it in this manner. A. You can make coils of one layer each, but the number of coils must remain the same. Better follow the instructions and use two layers in each coil. 2. Can ordinary paint be used for coating the top edges of a Leclanche battery cell to prevent the salts of sal ammoniac from forming? A. Paint is not of much value for this purpose. Better use paraffine, tallow, or wax.

(2) W. O. D. asks: 1. How long will bichromate plunger batteries last in constant use? A. Three or four hours. 2. Are they expensive to keep in order (recharging, etc.)? A. As compared with steam or gas for motive power, yes. 3. Would the same pattern serve to use on bells and other experimental purposes? A. It is not adapted to ringing bells, but is excellent for a great variety of experimental work. A. Would a motor on smaller scale work as well, using less battery and of course developing less power? A. Yes.

(3) H. R. Y. asks: 1. Is the dynamo electric machine described in SUPPLEMENT, No. 600, suitable for electroplating? If not, what change should be made? A. The dynamo referred to is not suitable for electroplating, but, by winding the armature with No. 12 wire, one layer in each coil, and the field magnet with No. 9, it may be made to answer the purpose. 2. Will cast iron do for the field magnet and armature core of the simple electric motor, described in No. 11, current volume of the SCIENTIFIC AMERICAN? A. Cast iron will do for the field magnet, but the armature core should be made of iron wire.

(4) E. C. asks (1) if a piece of wrought iron of the required dimensions would not answer for the armature core instead of one made of wire. A. Wrought iron will answer, but not as well as iron wire. 2. And if a field magnet made of wrought iron would not answer for the one made of strips of Russia iron? A. Yes. 3. Also if a battery, used for an electric bell, would develop sufficient power to run the motor itself, without using it to run anything else? The battery I have is a pile Leclanche. A. No.

(5) Old Subscriber.—SCIENTIFIC AMERICAN SUPPLEMENT, No. 384, contains directions for transferring and coloring photographs on glass.

(6) J. A. M. asks: 1. How can I find the required height of water in any steam boiler? A. In horizontal tubular boilers, the water line should be at one-third the distance from the top of the tubes to the top of the shell. In locomotive stationary boilers, the water line should be one-third the distance from the top of the crown sheet to the top of the shell. In vertical boilers of ordinary make three-fourths of the tubes should be in contact with solid water. 2. How to make flanges on boiler and dome heads. A. Put flanges on boilers with a putty made of white lead, iron borings, and Prince's metallic paint, equal parts, made up with boiled linseed oil. 3. How can I make a vertical steam boiler any size, at small cost? A. We cannot teach an easy way of boiler making. Make boiler in the regular way with good material and workmanship. 4. In making vertical boilers with the tubes extending up above the water, is there not danger of the tubes leaking? A. We do not approve of the use of vertical boilers, where a horizontal one can be made available. The exposure of the upper end of the tubes and to be sheet to undue heat is not desirable, and gives much trouble in that class of boilers, especially when made short, as for steam yachts and launches.

(7) F. W. P. asks: Is there any chemical which, added to melted glue, will keep it in a liquid state when cold? A. An excellent liquid glue is made by taking a wide mouthed bottle, and dissolving in it 8 ounces best glue in 1/2 pint water by setting in a vessel of water and heating until dissolved. Then add slowly 2 1/2 ounces strong nitric acid of 36° Baume, stirring all the while. Effervescence takes place with generation of fumes. When all the acid has been added, the liquid is allowed to cool. Keep it well corked and it will be ready for use at any moment.

(8) J. G. F. desires a good receipt for making root beer. A. Take 1 ounce each of saffron, allspice, yellow dock and wintergreen, 1/2 ounce each wild cherry bark and coriander, 1/4 ounce hops, and 3 quarts molasses. Pour sufficient boiling water on the ingredients, and let them stand 24 hours, filter the liquid and add 1/2 pint yeast, and it is ready for use in 24 hours.

(9) C. J. W. asks: Can cast iron be soldered so as not to leak water, and how? A. Solder cannot be made to flow on cast iron. Pure tin may be wiped over a crack by cleaning the surface and using tinner's acid, with a soldering iron.

(10) R. R. J. asks: Could an 8 light dynamo be run by windmill to charge a storage battery for lighting, and what power would be required to run it? A. Yes; eight 16 candle power incandescent lights will require about 1 1/2 horse power with an economical dynamo. A windmill of 2 horse power should be able to charge a storage battery for an evening during the 24 hours and accumulate a surplus.

(11) H. F. B. asks: Who was the patentee of the monkey wrench, and is the name spelled Monkey or Moncky? A. "Monkey" is the proper spelling. The name is largely used for mechanical and nautical appliances. The wrench is very old, and we do not know that it was originally patented.

(12) S. E. H. writes: I wish to make some hollow lead castings, about 4 pounds in weight, shell 1/8 inch in thickness. The crooked shape of casting prevents digging the core from the center and clearing it from obstructions, although there is a hole or opening at each end. Can I cast them in iron mould (in halves), using a suitable shape core, and use a liquid that will soften the core, so that it can be washed out? A. Make the core with flour paste, as little as possible to hold the sand. Make it in halves, so that you can excavate a passage clear through the center when the halves are pasted together. Scratch out all the sand possible from the casting and make a connection with a water faucet or pump and wash out the central parts. If the sand does not all wash out, pour in sulphuric acid 1 part, water 2 parts, mixed. It will soon loosen the sand so that it will wash.

(13) M. B. asks (1) a good cement to fill in the cracks of a floor before painting or staining it. A. You had better use strips of wood driven in and planed off smooth and even with the floor. Cement will break up and look rough in a short time. 2. What preparation is used for lamp wicks to obviate the necessity of trimming them? A. Use asbestos wicking for incombustible lamp wick.

(14) F. G. B.—The common varieties of prepared mullage are made by treating dextrine with sulphuric acid, which in time destroys the color of the stamp. Better use a mullage made by dissolving gum arabic in water.

(15) J. C. B. asks the best way to cover steam pipes laid in very damp, moist soil. Cold spring water around them condenses the steam as fast as it flows in. A. You cannot protect the pipes when water has free access to the covering. Make a dram beneath

the pipe, then box the pipe with an air space of 2 inches all around the pipe. Pipe can lay in chocks in the box to keep it in place. Cover the ends of the box to prevent circulation of air.

(16) J. S. G. asks how to straighten out pieces of zinc (which are cut for shoe patterns) so as to make perfectly flat. The number of zinc is 14. A. This work requires as much care as to flatten a saw blade. Gently hammer on a flat iron upon the parts that draw up or bulge, not on the bulge itself. A little practice is necessary.

(17) V. L. C. asks: 1. How to make a strong cement to mend china. A. See the article on "Cements" in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158. 2. How to make a preparation that will clean marble figures that are greasy and very dirty. A. Make a paste with fuller's earth and hot water, cover the spots therewith, let it dry on, and the next day scour it off with soft yellow soap.

(18) M. asks for a recipe for a yellow dye or stain, to stain sap pine or cypress. A. Either brush over the work with a tincture of turmeric or warm the work, and brush it over with weak nitric acid, varnish or oil as usual, a very small bit of aloes put into the varnish will give a rich yellow color to the wood.

(19) A. H. T. asks a receipt for a strong percussion cap, one that explodes easily. A. Use 100 grains of fulminating mercury triturated with a wooden muller on marble, with 30 grains of water and 60 grains of gunpowder. A solution of gum mastic in turpentine is used as a medium to attach the mixture to the metal.

(20) J. L. P. asks how to make common glue dissolved mix with linseed oil and remains so. A. We know of no means by which this can be accomplished. An alkali such as soda or potash would probably make them mix, but its effect would be to spoil the inherent qualities of the linseed oil.

(21) C. J. S.—You will find full directions for pressing plants and forming a herbarium in SCIENTIFIC AMERICAN SUPPLEMENT, No. 501.

(22) J. E. C. asks: What articles combined will produce spontaneous combustion in the shortest time? A. Water and potassium.

(23) T. B.—Ampere's theory states that currents of electricity travel around a magnet in planes at right angle to its axis, as if a fine wire were wrapped around it. No theory of any note holds that longitudinal currents exist in them. It is all theory and little more than a framework to organize facts. If the observer looks toward the north pole of a magnet, the current is assumed to move in the direction opposite to the hands of a watch.

(24) S. W. writes: I wish to use a low fusing solder of lead, tin, bismuth, and cadmium, and find difficulty in making a strong joint. What should I use as a flux to obtain a clean solid joint, and not raise the melting point of the alloy, which is 150° Fah.? A. Use Venice turpentine or Canada balsam.

(25) J. S. asks: What kind of woods are the best to resist the action of steam, with the least amount of warping? A. Yellow pine and oak.

(26) G. W. H. asks: What kind of oil should be used in oiling base ball bats after they are turned out, and how should the oil be rubbed in? A. Use boiled linseed oil on a rag.

(27) C. E. H. asks the best way of cleaning a bronze chandelier, soiled with fly specks, etc. A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 39, process for refinishing by dip and lacquer.

(28) E. C. H. asks: 1. Will you kindly answer through your paper, whether the body of field magnet, or armature core of electric motor described in your paper of March 17, 1888, could be made of soft cast iron without injury to the working or the power of motor? A. Yes. It has been described and illustrated in our columns. 2. Is there any way or process to melt or dissolve small pieces of carbon, such as thrown out of electric street lamps, so as to make it into sheets of 1/4 inch and upward in thickness? A. No. You may grind them to powder, and mix into a paste with sugar and water, and after moulding may heat them in a covered receptacle to full redness. This will give an inferior product, unless a retreatment with the slup, followed by a second baking, is given.

(29) J. P. F. asks: 1. Can you inform me how long the battery recommended will run the "Simple Electric Motor," described on page 165, of the March 17, 1888, number, before becoming exhausted? A. Three or four hours. 2. Can the battery described on page 390 of the December 17, 1887, number be used to run this motor? A. The battery is too small for the purpose.

(30) W. E. asks: 1. Could I not double the dimensions of the one described? A. Yes. 2. Would I need a larger size of magnet wire? A. The magnet wire may remain the same, and you can adapt its resistance to your battery by connecting the coils 2 inches parallel. 3. How many cells of bichromate battery would be required? A. About 12. 4. What power would it develop? A. Probably 1/2 horse power.

(31) O. M. W. asks: 1. What is the best and cheapest battery to run simple electric motor described in SCIENTIFIC AMERICAN (vol. lviii., No. 2), that will generate current enough to run two sewing machines? A. The plunging bichromate battery is best for the purpose. It will require about 8 cells. We expect soon to describe a battery adapted to the motor. 2. Could motor be run with an open circuit battery. (Leclanche or Bunsen). If so, how many cells of either would be required? A. The Leclanche battery is not adapted for running motors, as it polarizes in a very short time. 18 or 20 cells of Bunsen connected up in parallel will probably run the motor.

(32) W. P. K. asks: Is there anything with which paper may be saturated, so that the blank

portions of the paper will be a conductor, while the portions covered by printing will be a non-conductor of electricity? A. Use bronzed paper and write on it with thick India ink. The surface of the paper will then be a conductor, except where protected by the ink.

TO INVENTORS.

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