ENGINEERING INVENTIONS.

A rotary engine has been patented by Mr. John Marvin, of Northport, N. Y. The plates which form the steam chest are made to rotate upon a fixed shaft, through which steam is admitted to and exhausted from the chest, the pressure being equal at all points of the revolution and there being no dead centers.

A car heater has been patented by Messrs. George W. Carter and William T. Pickett, of Canyonville, Oregon. It has a water base, with pipes which conduct the water to the interior of the stove, and a guard or casing outside to prevent the contact of the heated surfaces of the stove with combustible material, making a self-extinguishing stove.

A station indicator has been patented by Mr. George C. Logan, of New Orleans, La. This invention covers a novel construction and combination of parts, providing means whereby an approaching station may be indicated within a car, and the apparatus containing the names of the several stations may be operated from the engine or car, the apparatus being simple and durable and easily manipulated.

A car coupling has been patented by Mr. John P Turney, of Arlington, Oregon. This invention covers a novel arrangement of pneumatic couplings and tubes, extending to the cab of the engineer, in combination with a compressed air reservoir and a switch conduit for directing the air blast through any of the tubes to any of the couplings, the coupling and uncoupling being effected by the engineer.

A railroad rail has been patented by Mr. Gilbert A. Ewing, of Jackson, Ohio. It is of the class of rails formed of two longitudinal interlocking sections, and the invention provides practically an endless rail, with which chairs and fish plates will not be needed, and wherein but few locking devices will be required, the rails also having an oval space between the webs of sections adapted to carry insulated telegraph wires.

MISCELLANEOUS INVENTIONS.

An inhaler has been patented by Mr. Almon K. Ives, of Missoula, Montana Ter. It has a powder receptacle with small perforations in its top and a suitable handle, with compressible air bulb and flexible tube, for forcing air into contact with the powder and expelling portions of the powder with the air.

A printer's galley has been patented by Mr. Frederick Schley, of Brooklyn, N. Y. The side and end pieces have a rib on the outer edge at the bottom, over which the bottom piece is bent and held in engagement therewith, thus reducing the cost of manufacture and making a galley that will stand hard usage.

A pole attachment for vehicles has been patented by Mr. William P. Fest, of Brooklyn, N. Y. The running gear of the vehicle has longitudinally extending spurs, and the pole has eyes, one in advance of the other, adapted to receive the spurs, whereby the fitting of the pole will be facilitated, and all rattling at the connections will be avoided.

A gun sight has been patented by Mr. George W. Wood, of Granville, N. Y., and James W. Carver, of Pawlet, Vt. This invention provides in one attachment a sight applicable for use at either a short or long range, and which may be used to gauge the wind, and also affords the advantages of a peep or closed sight and an open sight.

An animal trap has been patented by Mr. William H. Harden, of Quitman, Ga. It is designed mainly for rats, the invention covering a novel construction of the cage, in combination with suspending, tripping and locking mechanism, and automatically opening doors which permit the animal to enter, but do not allow of escape.

A seal lock has been patented by Mr. George W. Lewis, of Portsmouth, Va. It has a slotted metallic casing, a locking block eccentrically pivoted therein, having a lip with a perforation, in combination with a fragile seal, being especially adapted for securing a freight car door, so that the fastener cannot be released without breaking the seal.

A puzzle has been patented by Lizzie E. Simpson, of New York City. It consists of a board provided with a series of pin apertures arranged in intersecting lines and baffle apertures promiscuously arranged upon the board, contiguous to the lines of pin apertures, being intended to afford an interesting study and pastime to children and adults.

A washing machine has been patented by Mr. John W. Lasswell, of Augusta, Kansas. It is a machine of that class in which two oppositely reciprocating rubbers are employed in a tub or vat, the invention covering novel details of construction, designed to provide a machine which will be thoroughly effective, simple, and durable.

A galvanic battery has been patented by Mr. Howard Cassard, of Baltimore, Md. It has a cover formed as a cup with a liquid seal, and a bent tube communicating with the fuming cell of the battery and trapped in the liquid seal, with other novel features, the battery being designed with reference to greater efficiency and to prevent the escape of gases.

A well has been patented by Mr. Henry Piering, of New York City. This invention covers a metallic cylindrical curb support, with teeth on its bottom, perforations around its body, and a flange on its top, to be placed in the bottom of a partly excavated well hole and sunk to the desired depth as the masonry wall is built up from the flange.

A corn husker has been patented by Mr. Theodor H. Mehring, of Niobrara, Neb. It is an implement which may be worn upon the bare hand, or upon the hand when incased in a glove or mitten, being made in two sections, sliding one upon the other, the device being simple and cheap, and capable of quick adjustment to suit the breadth of any hand.

An elevator and conveyor for unloading and loading vessels, etc., has been patented by Mr. James F. Simmons, of Manistique, Mich. This invention covers a novel combination and arrangement of parts in a machine having a universal adjustment, permitting its use in many positions, as for transferring goods from a vessel to a car and *vice versa*, and for various other purposes.

A lock has been patented by Mr. Henry Van Hoevenbergh, of New York City. This invention relates to what are known as "pin tumbler locks," especially adapted to places in which the control of the lock is limited to a given time or particular persons, and is intended to obviate the necessity of changing the lock when a change of ownership or control is made.

A middlings purifier has been patented by Mr. Victor Monnier, of Dundas, Minn. The interior of the machine is in separate compartments, the air currents of which are regulated independently, whereby each grade of material may be treated separately, without affecting the other grades, and there are various other novel features of construction and combinations of parts.

A sad iron has been patented by Mr. Horace S. Pease, of Cincinnati, Ohio. This invention relates to a former patented invention of the same inventor, the fluting plate being made attachable and detachable, and to serve also as a shield to protect the operator's hand from contact with the hot chimney and from the heat arising from the heated smoothing iron.

An apparatus for the manufacture of charcoal has been patented by Mr. Jacob Scherffius, of Winona, Minn. The charring of the wood is effected in a chamber about which the products of combustion pass without entering, the heated air being continuously used, while provision is made for gathering and condensing all products given off by the wood during the processes of charring.

A spring bed bottom has been patented by Mr. Anthony Huber, of New York City. The body of the spring bottom is formed of thin metal cross strips, riveted together at their intersections, at which points are attached spiral springs, the construction being such that the springs can be readily applied where desired and conveniently removed when the cot is to be folded.

A feed bucket has been patented by Mr. Albert M. Smith, of Westerly, R. I. It has a frame with inwardly extending arms holding a spring upon which rests a feed receptacle, a detachable partition being held within the receptacle, whereby the horse will be unable to obtain more feed at a time than he can conveniently eat, and wherein also there will be no waste.

An ice velocipede has been patented by Messrs. George B. M. Ribble and Charles C. Spencer, of Cortland, N. Y. It is made in triangular form, and so that the front runner and main frame have free up and down movement independent of the two rear runners, and is provided with a propelling mechanism of novel character to be operated by the feet of the rider.

A smoke consumer has been patented by Mr. Robert H. F. Sewall, of Birmingham, Ala. Combined with a furnace is a superheating chamber, the smoke passage communicating therewith, an oil supply pipe leading into the chamber, and a perforated burner pipe, with other novel features adapted to securing a more perfect combustion under various forms of construction.

A drier has been patented by Mr. Arthur Buel, of New York City. It has sections of porous refractory material secured to frames and connected to form an endless apron, with drums over which the apron passes, in combination with furnace openings and a drying oven, and other novel features, the invention being especially applicable in the drying of white lead, whiting, and other pigments.

A combined cradle and rocking chair has been patented by Messrs. William Furl and Rudolph Fraenzel, of Lock Haven, Pa. The construction is such that a rocking chair may be conveniently drawn out of the crib frame and adjusted for use, and get readily adjusted for telescoping therein, the several rockers assuring a strong support for both the chair and cradle.

A tobacco pipe has been patented by Messrs. Thomas B. Whitledge, George W. Kenner, and Michael Rueckert, of St. Mary's, Mo. Combined with an apertured cap are various parts operating in relation to each other, the cap, and the interior of the bowl, to prevent the tobacco from falling from the bowl, for pressing it more closely or loosening it, or for scraping and cleaning the bottom of the bowl.

An ice creeper for horses has been patented by Mr. Charles S. Acheson, of Philadelphia, Pa. The body of the creeper is formed of a flat plate adapted to set up against the forward part of the bottom of the shoe, and having a recess fitted to receive the toe, with threaded sockets in which spurs are inserted, the creeper being attached to the horse's foot by a strap and buckle.

An apparatus for transporting and setting stone has been patented by Mr. Donald McDonald, of Louisville, Ky. Combined with a suitably supported and adjustable mast is a cable having its end portions disposed around guides on the mast, with other novel features, forming an apparatus designed to facilitate the lifting of stone, carrying it and lowering it in position, as required in building bridge piers, constructing buildings, etc.

A fireplace forms the subject of a patent issued to Mr. Robert B. Berrie, of Lexington, Mo. The grate has a rearwardly inclined back, above which is held a corrugated top plate, a fixed hood being held in front of and above the top plate, and a flat plate held to slide thereon, to increase or diminish the opening between the top plate and hood, whereby the draught can be easily regulated and the heat directed into the room.

A last block fastener has been patented by Mr. William Cook, of New York City. The last block has in its under side a slot open at its upper end, the block having a countersunk recess, and the fastener having a shank connected with the last body and constructed with a flattened head, in such manner that the head may be grasped by the ordinary pinchers or pliers, the fastener being quickly and easily manipulated to lock the block in place or allow of its removal.

A fifth wheel has been patented by Messrs. Jonathan G. and Lemuel H. Huff, of East Bend, N. C. The lower fifth wheel section, secured on the axle iron, has a king bolt opening formed through it leading to the axle iron, and is provided with a keyway or slot, the upper section having a king bolt with a key fitted to the keyway of the lower section, such king bolt being extended through the opening in the lower section and bearing at its lower end on the axle iron.

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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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Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(1) Subscriber asks: Is there such a thing known as anything being set on fire by spontaneous combustion? If so, when, how and where? A. Wet hay in stacks, and oily cotton waste, such as accumulates in mills, often becomes ignited by spontaneous combustion. Spongy platinum will ignite hydrogen gas. Other instances could be cited.

(2) D. T. G. writes: I wish to get 1 ohm resistance with a length of wire of about 3 feet. A. German silver has about 13·6 times the resistance of copper wire, 2·75 feet of No. 24 (American wire gauge)

German silver wire will have about 1 ohm resistance. It will be an approximation only, as every sample of wire varies more or less.

(3) C. C. wants to know how many coats of lacquer should be put on gas fixtures, for ten years' wear, and how to make the different colors. Can it be put on hot? If so, what is the process? A. Only heat the articles to about 200° Fah. before lacquering. For the process and how to make lacquer, see "Techno-Chemical Receipt Book," which we can mail for $2.

(4) C. B. P.—The crank pin of an engine is supposed to travel with an even motion or as nearly so as the fly wheel can control, considering the unequal pressure upon the piston in the first and second half of its stroke. The impulse given during the first half of the piston stroke slightly accelerates the crank velocity. It is the piston itself that has a variable motion under the regulating influence of the fly wheel, so that from the dead center to the first quarter revolution of the crank, the piston travels farther than for the second quarter, or to the next dead point; the difference being greater for a short connecting rod.

(5) H. W. S., Jr., writes: I have a cistern from which a lead pipe connects with a pump in the kitchen. The water is of a yellowish cast and very foul. The water drawn from the neck of the cistern with a bucket is of good taste and void of odor. Can you give me a remedy. A. The surface water of your cistern is purified by absorption of air. There is no circulation by which the water at the bottom is brought to the surface. The oxygen or air that is carried into the cistern, combined with the water, is soon absorbed in oxidizing the vegetable and other matter in the water. When no more oxygen is available a putrid decomposition sets in, which is the trouble that you complain of. The only remedy is thorough and often cleaning of the cistern, or forcing air down to the bottom, allowing it to bubble up through the water. A small force pump will answer the purpose. A bag of charcoal pushed down to the bottom, and held there, may improve the water.

(6) F. G. B.—You can remove most of the old varnish from your guitar by rubbing the scratched parts with 95 per cent alcohol on a clean rag until the color appears even, then varnish with a mastic varnish, using a flat camel's hair brush, going over the work quickly. You may make the mastic varnish by dissolving 12 parts sandarac, 6 parts shellac, 6 parts mastic, and 3 parts elemi in 150 parts 95 per cent alcohol. Put the whole in a bottle and warm in a water bath until the gums are dissolved, then add 6 parts of Venice turpentine and thoroughly shake up warm. If too thick to spread freely, add alcohol to suit the requirement.——For hardening small tools, rub soap upon the surface, and in the threads of taps and dies, then heat to a cherry red and immerse in salt water, a handful of salt to half a pail of water.

(7) B. W.—For a good cup grease melt and thoroughly mix while hot equal parts fresh clarified tallow and heavy petroleum oil or engine oil. For axle grease add to the above 15 per cent by weight of ground plumbago. Stir well while cooling, to make the mixture perfect.

(8) C. H. C. asks a receipt for the cleansing of oil drippings, such as caught in the pans under the bearings of shaftings, so that the oil can be used again. A. The purification of such oil drippings by chemical processes is entirely unsuited to ordinary shop work. We can only recommend settling the oil in a large open can and dipping from the surface. If this does not make it clear enough for use, fill the can half full of water, or filter the settled oil through a sponge stuffed in the bottom of a can.

(9) F. M. desires a formula for making dark mahogany stain from aniline for furniture and chairs, one that will not fade. A. We would recommend the following in preference to aniline. Boil half pound madder and 2 ounces logwood chips in 1 gallon water and brush well over while hot. When dry go over with pearlash solution, 2 drachms to the quart. By using it strong or weak, the color can be varied.

(10) A. P. Y. desires (1) a formula for bleaching hair. A. For bleaching the hair use a three per cent solution of peroxide of hydrogen, concerning which, its preparation and application, see the article on that subject in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 339 and 545. 2. Also same for the menthol pencil for headache. A. Menthol having a melting point of 42° C. is fused and then poured into metal moulds. Usually, however, the menthol is diluted by mixture with varying proportion of wax, stearine, or paraffine.

(11) T. B. asks: 1. Is there any substance or method by which froth on a saccharine liquid could be avoided or killed, for instance in aerated mineral waters? A. A little vapor of ether will tend to do it. A drop of ether in each bottle would answer. 2. Could you give me a good and cheap recipe for peppermint cordial? A. To 40 gallons proof spirit add 4 ounces essence of peppermint dissolved in 95 per cent alcohol. Color with ½ pound powder of turmeric infused in 1 gallon spirit 95 per cent.

(12) M. M. H. writes: At the recent eclipse of the moon, the earth's shadow appeared as a thin veil over the surface of the moon, the light shining through with a dull reddish hue. If the moon at this time of her opposition was exactly in her node, consequently totally eclipsed, why was any light visible? It seemed different in this respect from any previous total eclipse. A. The moon was nearer to the earth in this eclipse than in others less remarkable. The light on the moon during totality was derived from the sun rays refracted by the outer or thin portion of the earth's atmosphere. The outer atmosphere being a globe of very low density, acted as a lens, drawing the sun's rays in and crossing the earth's dark shadow.

(13) G. G. writes: I have been using asphalt varnish to renew the gloss on rubber boots and shoes, which in a degree is a success. Can you suggest any addition to perfect the same, also to kill the fume of the asphalt? A. Asphalt varnish is the only article that we know of that can be used for the purpose mentioned, and we can only suggest, as there are various grades of that varnish, that you secure the best.

(14) J. B. writes: Can you furnish me a recipe for making "papyrograph writing paper," like the piece inclosed? A. The paper is saturated with a resinous varnish, and you will find in Spons' "Workshop Receipts," second series (which we can send you post paid for $2), a description of its treatment. Try paper brushed over with boiled oil in which a little shellac has been carefully dissolved over a slow fire, then suspend on a line till dry.

(15) C. F. S.—S is right. The hydrostatic pressure is the power that discharges the water. It is always equal for equal heights without reference to the area of surface.

(16) A. E. S. asks: Which possesses the greater strength when placed horizontal, standing on highest edge—a piece of timber 40 feet long, 12×18 inches, or piece same length, but 14×16 inches? A. The 12×18 inches is the strongest, its moment of inertia being 5,832, while the moment of inertia of the 14×16 beam is only 4,778, and their safe load at center 6,026 pounds and 5,555 pounds.

(17) F. C. M. asks how to make the ordinary torpedoes, such as cost about five cents a package. A. They consist simply of a few grains of coarse sand twisted in pieces of paper containing a small quantity of fulminate of mercury.

(18) H. J.—The surface of the earth in one geographical mile "falls away" or departs from a straight line 8·04 inches.

(19) H. S. T. asks: The process of dyeing in colors sheep skins that have been tanned with wool on. A. To dye the hair on the leather, use receipts similar to those employed in dyeing ordinary wool. Anilines for instance can be used, but in order to avoid spoiling the fur, you had better consult some of the text books on dyeing.

(20) J. A. H. asks: 1. How to make the menthol or "Japanese headache cures," not hard as they are, but in a liquid or semi-liquid state, as a salve or liniment, to be rubbed on different parts of the body, etc. A. Menthol cones are made by mixing menthol with various waxes. It is the proximate principle in oil of peppermint, and can be obtained by cooling the oil to 15° C., whereupon the menthol crystallizes out of the oil. 2. A grape sirup, not an artificial sirup, or one for fountain use, but a sirup from the fruit, for domestic or table use, etc. A. Take 20 lb. ripe freshly picked and selected tame grapes, put them into a stone jar and pour over them 6 quarts of boiling soft water; when sufficiently cool to allow it, well squeeze them thoroughly with the hand, after which allow them to stand 3 days on the furnace with a cloth thrown over the jar, then squeeze out the juice and add 10 lb. of crushed sugar; let it remain a week longer in the jar; then take off the scum, strain and bottle, leaving a vent until done fermenting, when strain again and bottle tight, and lay the bottles on the side in a cool place. 3. A decoction, infusion, or tea of malt and hops, to be used as a tonic drink, what to add to preserve it, if anything. A. Take extract of malt 4 fluid oz.; phosphate of iron U. S. P. 1880, 128 grains; water 1 fluid oz.; fragrant elixir enough to make 1 pint. Dissolve the phosphate of iron in the water with the aid of heat, add the extract of malt and sufficient fragrant elixir to make one pint; allow the whole to stand 24 hours and then filter. 4. What quantity of what substances (bicarbonate soda, etc.) to charge water with gas in bottles or siphons, to imitate fountain soda (without marble dust and acid), to gain the time necessary to cork bottle. I thought to place powders in separate gelatine capsules, etc. A. To one gallon of water add 5 lb. of loaf sugar, one ounce Epsom salts, one ounce cream tartar, and 5 oz. tartaric acid. Boil the preparation well, skimming off the refuse matter accumulating upon the surface. After cooling set it away in bottles in a cool place. When drinks are desired, put 2 or 3 tablespoonfuls of this sirup into a tumbler two-thirds full of water, add one-fourth of a teaspoonful of bicarbonate of soda, stir briskly, and the effervescence will be equal to that from fountain soda. 5. To make "Sozodont" or a close imitation of the same, or something similar and as good. A. Take of potassium carbonate ½ oz.; honey 4 oz.; alcohol 2 oz.; water 10 oz.; oil of wintergreen and oil of rose sufficient to flavor. 6. I have some suppositories made of quinine and cocoa butter; how can I find out how much quinine there is in each? Can I do this myself? Or how much cost to have this done? A. If you are an analytical chemist, the determination of the quinine can be made by known processes for which consult the usual text books. Otherwise refer the matter to an analyst, whose charges will depend upon his reputation.

(21) H. M. writes: We have a set of black hair cloth furniture that has been flooded. How can we clean it? A. The cloth can be cleaned by using the preparations recommended in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158, for cleansing fabrics from spots and stains, and the woodwork should be rubbed down with furniture polish.

(22) C. B. M. asks: 1. How long will a common horseshoe magnet retain its power of attraction? A. If an armature is kept in contact with its ends, it will last for many years. 2. How are they charged? A. By stroking in one direction with another magnet, or by placing the limbs within coils of wire and passing strong currents through the coils. 3. Can the power of the same be increased or diminished without increasing or diminishing the size of the magnet? A. Their power varies greatly, and below the maximum, without regard to size. 4. Of what is loadstone composed? And where is it obtained? A. Loadstone is an oxide of iron, Fe_3O_4, and is found in a great many localities, in Sweden, in the Ural Mountains, and elsewhere.

(23) C. S. A. writes: What kind of a wash can I use to remove tobacco stains from new pine floors? I have just finished a new house, and the mechanics have left tobacco stains upon the floors, which sal soda and hot water does not entirely remove. A. Take one part calcined soda and allow it to stand ¾ hour in 1 part slaked lime, then add 15 parts water and boil. Spread the solution thus obtained upon the floor with a rag, and after drying rub with hard brush and fine sand and water. A solution of 1 part concentrated sulphuric acid and 8 parts water will enliven the wood after above application. When dry, wash and wax the floor.

(24) I. E. P. asks: 1. How to make extract of carnation pink? A. See the article on "Perfumes and Formulas for their Manufacture," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 472. 2. A receipt for making a disinfectant which, after evaporating, leaves a pleasant odor like mint. A. Take 1 part rectified oil of turpentine, 7 parts of benzine, with the addition of 5 drops of oil of verbena to each ounce of the mixture. Almost all essential oils act as disinfectants, but their value is slight.

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