

ENGINEERING INVENTIONS.

A gauge cock has been patented by Mr. Charles B. Rogers, of St. Peter, Minn. The invention is specially applicable to that class of steam boilers where it becomes necessary, on account of the height of the boiler, to lead the gauge water and steam down by means of pipes attached to the gauge cocks, for which special novel devices are provided.

A process of treating iron has been patented by Mr. Brock Woodruff, of Albert Lea, Minn. This invention covers the treating of iron with a mixture of sand, salt, and black oxide of manganese, subject to alternate heating and cooling of the metal, and thus making an iron for rails, plows, journals, bearings, etc., where hardness and toughness is required.

The art of constructing tunnels is the subject of a patent issued to Mr. De Witt C. Haskin, of New York city. The invention covers the use of iron plates to form a projecting hood in advancing a tunnel excavation, and various other improvements, such as have been in practical use in the building of the Hudson River tunnel between New York and Jersey City.

A coke oven has been patented by Mr. Jonathan Green, of Leisenring, Pa. The invention covers the use of a cradle of gas pipe arranged over the oven bottom, with fine perforations for distributing steam or hot air, or for the application of hot blasts, the cradle being also contrived for quickly discharging the coke, by the application of power, with other novel devices.

A railway signal for locomotives has been patented by Mr. Joseph J. Stoetzel, of La Salle, Ill. The invention provides for an arm pivoted to swing vertically on the locomotive, moving up and down automatically by fixed inclined rails or ways set at suitable points along the side of the track, the arm being so connected as to ring the bell of the locomotive as desired.

An ore concentrator has been patented by Messrs. William B. Kennedy and Watson M. Nesbitt, of Silver Reef, Utah Ter. In combination with a sluiceway are independent detachable agitators and governors, with other novel features, to more effectually wash and separate the ores, and remove the concentrates from the sluiceway, than has been heretofore possible.

A speed clock for machinery has been patented by Mr. William H. Lord, of New York city. The clock works are made the same as for an ordinary clock, but the worm wheel that carries the speed hand is supported and separated from the time clock works by a bridge and hollow journal, there being hands which revolve one in sixty hours, one in sixty minutes, and one in sixty seconds, to show the loss or gain in speed of an engine or other machinery.

MECHANICAL INVENTIONS.

A mechanism for converting motion has been patented by Mr. Norman D. Wells, of Hastings, Minn. It is designed for converting reciprocating into rotary motion, and consists in a novel construction of operating pawls, arms, and friction bands, and in mechanism for reversing motion.

A gauge for adjusting planer knives has been patented by Mr. Francis B. Thompson, of Beaumont, Texas. It is designed for use in planing mills to hold the side heads in best position for filing, sharpening, or setting the bits, affording a strong machine for holding the side heads firmly as the workman may desire.

AGRICULTURAL INVENTIONS.

A gang plow canting device has been patented by Mr. Wm. Kimmel, of Milton, Ind. Each plow has two independent hitching rods to connect it with the truck, to which a lever is pivoted with a latch, so the rod may be easily raised or lowered to cant the plow.

A seed sower has been patented by Mr. William H. Thomas, of Fulton, Mo. The object of this invention is to sow seed from the rear end of a wagon by the assistance of a person riding in the wagon, for which there is a special wagon attachment of novel construction.

MISCELLANEOUS INVENTIONS.

A dinner pail has been patented by Mr. Thomas F. Freil, of New York city. It has perforations in the middle part of its cover, to allow of air circulation, and curved wires so attached that a cup can be carried without obstructing the passage of air.

A pendant, which is simple and ornamental, has been patented by Mr. Bernhard Dreyfus, of New York city. A crescent shaped flanged holder is made to carry two pendants or drops, and a ball may also be suspended between the pendants.

A stove pipe damper has been patented by Mr. William E. Bellman, of Buffalo, N. Y. This invention covers improved means of connecting the pivot rod for adaptation of dampers of different sizes, and is applicable as well to hot air pipes as to smoke pipes.

A folding egg case has been patented by Mr. William G. Ruge, of Washington, Mo. The case has upwardly projecting screws on fixed and hinged end pieces, with a cover on which nuts are held to be rotated by wires through annular grooves in the nuts, and the box has a removable partition.

An electric register for fluid reservoirs has been patented by Mr. Charles S. Lockwood, of Newburg, N. Y. The apparatus is actuated by the rise and fall of the fluid, thus making and breaking an electric circuit connected with electro mechanical registering mechanism.

A skate sharpener has been patented by Mr. Xavier St. Pierre, of Osceola, Nevada. This invention covers a novel shaped file, and holder therefor, affording a convenient device for sharpening the runners of a skate, and one with which no difficulty will be experienced in forming a uniform gutter.

A fence post has been patented by Mr. John C. Fiero, of Milo Center, N. Y. It is of wrought iron, made of a single rod bent at its middle, the two halves being brought close together and parallel to form the body of the post, and the ends made to diverge outward and inward to form legs or braces.

A stove pipe thimble has been patented by Mr. Godfried Laube, of Huron, Dakota Ter. It has a flaring outer end large enough to admit the bead of the stove pipe a suitable distance for being secured by screws screwing obliquely through the outer end of the thimble against the bead.

A compound for the manufacture of artificial stone has been patented by Mr. Hermant Benning, of New York city. It consists of Rosedale or Portland cement, oxalic acid, chalk, muriatic acid, iron filings, and water, in specified proportions, and compounded in a special way.

An improved fire proof building is the subject of a patent issued to Mr. William H. Dolman, of Brunswick, Mo. The patent relates to former improvements patented by the same inventor, and covers the application of ashes, dry earth, etc., for protecting the joists and other woodwork of buildings from fire.

An improved grate has been patented by Mr. John T. Synder, of Luzerne, Pa. This invention provides for a grate capable of clearing the fire of clinkers automatically by the rocking of the grate on its bearings, securing a better regulation of the fire and a more economical use of fuel.

A hood for vehicle tops has been patented by Mr. Charles T. Shreve, of Delaware, N. J. The invention covers a plate made in two parts, connected by hinges, so the hood can be readily folded for transportation, the object being to afford better protection from rain and snow to persons riding in top carriages.

A hitching strap has been patented by Mr. Samuel Birdsall, of Susquehanna, Pa. It is made with a brace strap connected with the tie strap by a bolt, nut, and washer, or other suitable coupling, so the brace strap will be firmly connected with the tie strap, and can be readily swung to either side.

A dump cart has been patented by Mr. Robert Clark, of Brockville, Ontario, Canada. This invention covers a special construction and combination of parts, for both wagon and harness, so that the weight upon the cart tongue bears directly upon the saddles of the horses, and they are enabled to carry the load naturally.

A refrigerator has been patented by Mr. Isaac T. Dyer, of Quincy, Ill. The ice rack is formed of a series of vertically movable troughs or gutters, and the openings through which the cold air can pass from the ice into the refrigerating chamber can be regulated at will, the refrigerator being easily taken apart for packing and cleaning.

A revolving double trapeze has been patented by Mr. Edward J. Leamy, of Syracuse, N. Y. The invention consists in a centrally pivoted frame, with means on one of the pivots for revolving the frame, from each end of which a frame is suspended, the trapeze being adapted to be revolved on its transverse central axis.

A spark arrester has been patented by Messrs. Elias B. Baldwin and Effenger R. Kline, of Sayre, Pa. Combined with the smoke box is an outlet pipe extending downward and backward, and there is a winged wheel on a shaft in front of the outlet ends of the exhaust pipes, the wheel being operated by the exhaust steam.

A sink spout has been patented by Mr. John G. Coburn, of South Carthage, Me. The object of the invention is to make a sink spout that may be easily thawed out when frozen, and for this purpose an additional pipe extends from a perforated top along one side of the waste pipe, a cup affixed to the additional pipe allowing of hot water to be poured therein.

A fire escape has been patented by Mr. Thomas Hale, of Claydon, Eng. The invention covers a novel construction and arrangement of parts, making a distinctive supporting and lowering apparatus, the supporting frame being light and easily applied in a window opening, and the lowering apparatus consisting of a canvas bag distended by a hoop, and suspended by a metal yoke or branch ropes.

A compound and self-acting plug valve for wash basins has been patented by Mr. Thomas P. Ford, Jr., of Brooklyn, N. Y. Rigidly connected valves are fitted in the supply and discharge pipes, so that one shall close as the other opens, and vice versa. There are also special contrivances to prevent waste, and to seal the outlet valve against the escape of noxious gases.

An apparatus for treating leather stock with naphtha to extract oils has been patented by Mr. Frank F. Newell, of Chelsea, Mass. A water tank surrounds the lower part of the naphtha tank, and there is a steam pipe and coil for heating the interior of the naphtha tank, by which the naphtha-extracted leather stock may be so treated that the vapor expelled in drying can be regained.

A rotary peg cutter has been patented by Mr. John L. Coleman, Jr., of Wattsborough, Va. The invention covers a disk with two sets of oppositely disposed cutters, the disk being journaled in a pivoted support and receiving a rapid rotary and slow oscillating motion; and it may be operated by hand, foot, or other power, as desired by either dealer or manufacturer.

A gas and lamp bracket has been patented by Henry P. Drew, of New York city. The object of the invention is to prevent gas burners and lamps from being swung against the walls or window curtains; the bracket is two jointed, with an adjustable cross bar so arranged that the pipe between the joints can be held stationary or allowed to move as desired to either side, with other novel devices. The same inventor has obtained another patent covering similar improvements for a one-jointed gas or lamp bracket, with an adjustable cross bar connected with the joint, for a like purpose.

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The above is the title of a volume of 260 pages from the pen of Mr. A. Wazon, civil engineer, upon the subject of how to supply our cities with water, which has always been one of great importance, and which becomes of increasing moment with the rapid growth of population in our large cities. The greater part of the work is devoted to the subject of drainage of our cities and dwellings, and the proper plumbing and sewerage of our houses. The treatment is quite different from that which the work would receive at the hands of an American or English writer, but the matter is of interest to an American, as the subject is carried one step further than it would be here; the methods employed in converting refuse from the sewage pipes into valuable fertilizers is taken up and discussed. Mr. Wazon conducts his investigations by following the course of the pure water from its several natural sources until it is distributed into a common reservoir; he next notes its course after it has become impure and has been discharged from houses and residences until it mixes with the water from the public highways in the common sewer. Then the course of the sewer water is followed until it reaches the place where it is purified and portions of it become of great value as fertilizers, while the residue, which is for the most part water, is cleansed and of a purity almost equal to that which it possessed when first delivered at the reservoir. This water is then conducted to some neighboring stream, and thus carried away to the sea, deprived of dangerous germs and of that invisible power of doing harm which would be so incalculable in a country like France, where the rivers are small and the population so dense, were it not for some such system as this. This work is published by Baudry & Co., 15 Rue des Saints-Peres, Paris, France. Price 15 francs.

Notes & Queries

HINTS TO CORRESPONDENTS.

Name 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 mail, 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) E. E. H.—In making plaster of Paris moulds for rubber stamps the type is first rubbed full of hard soap, the soap is then removed from the surface of the type by means of a brush and water, leaving the deep parts filled with soap. A rather thick layer of very fine plaster of Paris is now poured over the type and allowed to set. There are two ways of making the stamp from this mould. One is to take elastic rubber already vulcanized and lay it over the plaster mould and apply pressure like a spring, and then boil the whole in salt water for some time, until the rubber is forced into the interstices of the mould, then allow the whole to cool together before trying to separate the rubber from the mould. Another method is to place the unvulcanized rubber in a flask containing the mould, and then place the whole in a vulcanizer for some time under steam heat and pressure.

(2) G. E. W. asks (1) what metal will expand most at a degree of heat of 104, same being in shape of rod five-sixteenths or three-eighths inch. A. Zinc. 2. Do you know of any chemicals that will harden plows, and by what process, same as when come from plow factory. A. A simple method of case-hardening iron is to sprinkle powdered potassium ferrocyanide (prussiate of potash) over the articles at a red heat, and then plunge into water. Potassium bichromate with the pith of rams' horns may be used with good results. The method is described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 23.

(3) T. B. asks (1) how steel lower dies are struck up from the upper or hub die; whether they are struck up when hot, or the steel made soft and then struck cold, and how steel is made very soft for that purpose? He has tried it in hot steel under a drop press, but finds that the fine lines do not come up. A. Steel dies for drop press work are struck up hot, if deep, so as to get the general depression. They are then annealed, and the scale cleaned off with muriatic acid and water, equal parts; give the die a partial polish, and finish the figure under the drop cold. Flat work dies may be struck up cold. To soften a steel die for stamping or a hob for cutting, heat to a full or cherry red, let it cool in a heap of hot ashes or lime. When it loses its red color or you no longer see it red in the dark, souse it in water; this is called water annealing. If the fine lines do not come up after the first trial, put some soap upon the surface of the die and anneal again. The soap keeps it from scaling. Clean the surface at each annealing with acid as above. You can perfect the die in this way. 2. Also how stereotype moulds are made, of what kind of paper, if it can be bought already prepared, and how stereotype metal is made? A. The following is the process for casting stereoplates by the paper process: Lay a sheet of tissue paper upon a perfectly flat surface and paste a soft piece of printing paper, which must be pressed evenly on to the tissue. Lay the paper on the form previously oiled,

and cover with a damp rag; beat with a stiff brush the paper in evenly, then paste a piece of blotting paper, and repeat the beating in; after which about three more pieces of soft, tenacious paper must be pasted and used in a similar way; back up with a piece of cartridge paper. The whole must then be dried with moderate heat under a slight pressure. When thoroughly dry, brush well over with plumbago or French chalk. When this is done, it is ready for the matrix. This is a box of a certain size for the work required, the interior of which is type high. In it is what is termed a gauge, which lifts out to insert your paper cast, and is regulated by hand to the size of the plate required. This being placed inside, the lid is shut down and screwed tight with the end or mouth piece left open. By this orifice the metal is poured in, and as it is mounted to swing, the box is moved about so as to well throw down the metal and make a solid cast. Then water is dashed on the box, the screwbar unshacked, the lid lifted, and the paper cast is again ready for work. Stereotype metal consists of one part tin, one part antimony, and four parts of lead. In using stereotype metal, brush the type with plumbago or a small quantity of oil, then place in a frame, and take a cast with plaster of Paris.

(4) S. C. T. asks: 1. What causes steam boilers to foam, and can it be prevented? A. The foam results from dirt in the boiler, probably resulting from using an impure water. It can be remedied by the employment of anti-incrustation agents; see SCIENTIFIC AMERICAN SUPPLEMENT, No. 286, for full information on this subject. 2. How can he mend a crack or break in a piece of marble on a table, color not an object. A. The following is the recipe for cement used by marble workers: Flowers of sulphur 1 part, hydrochlorate of ammonia 2 parts, iron filings 16 parts. The above substances must be reduced to a powder, and securely kept in closely stoppered vessels. When the cement is to be employed, take 20 parts very fine iron filings, add 1 part of the above powder. Mix them together with enough water to form a manageable paste. This paste solidifies in 20 days, and becomes as hard as iron.

(5) G. H. P. asks how to stain a gun stock in imitation of rosewood, the stock being made of black cherry. A. For the rosewood stain use the following: Take 1 gallon alcohol, 2 ounces of camwood, set them in a warm place twenty-four hours; then add extract of logwood 3 ounces, aquafortis 1 ounce, and when dissolved, it is ready for use; it makes a very bright ground, like the most beautiful rosewood. Use one, two, or more coats as you may desire. 2. What is used to blue a gun barrel? A. Gun barrels are blued by applying nitric acid and letting it eat into the iron a little, then the latter will be covered with a thin film of oxide. Clean the barrel, oil, and burnish.

(6) J. M. E. asks directions for making a good varnish for paint that will stand the weather for doors, or if there is such a varnish. A. To make a good varnish is a trade in itself. Purchase a wearing body varnish, the make of any well known manufacturer.

(7) J. A. C. asks: What is used to make the gold lines in the tracings on musical instruments and marble mantels, etc.? A. If none of the bronze powders prove satisfactory, we would recommend you to procure the real gold bronze, and then coat the work when finished with some transparent varnish.

(8) H. H. writes: Some time ago you gave a formula for removing black heads and pimples, consisting of kaolin 4 parts, glycerine 3 parts, acetic acid 2 parts, with a small quantity of ethereal oil. I had the above mixed, but it has a very disagreeable smell. What can I use to give it an agreeable odor? A. We fear you have neglected to add the "small quantity of ethereal oil," such as oil of rose, oil of cloves, essence of lemon, of bergamot, etc.

(9) F. H. asks the receipt for making the preparation which is used on ribbon stamps to renew the ribbon when the color comes out. A. Dissolve 1/4 ounce carmine in 2 ounces strong ammonium hydroxide, or else 1/4 ounce aniline color of suitable shade in same quantity water and add 1 drachm of glycerine and 1/4 oz. of dextrine.

(10) R. H. asks (1) whether there is a firm manufacturing paper pipe of the same material used in making car wheels. Iron pipe rusts so rapidly in our damp, sandy soil that we thought pipe made of paper would answer better. A. We understand that paper pipe, made by rolling thick paper asphalted upon mandrels and cementing by heating, has been made and used in France. We do not know of its being made or in use in the United States. Galvanized iron pipe is now used generally underground except for the larger sizes, in which cast iron is preferred; both are durable. 2. Would also like your opinion as to whether or not water can be drawn through a 3 inch pipe a distance of 3,000 feet with gradual elevation of 25 or 27 feet with steam pump. Our factory is about that distance from a lake and about that height above the level of it, and we would like to know if we can draw our supply of water from the lake, as our wells are almost dry. A. Yes, but you will have some trouble in getting the water started in so long suction.

(11) T. D. M. asks: 1. What is the best treatment, both preventive and cure, for puppies from one to three months old that have round worms four or five inches long; I think they are the Ascaris marginata? A. For a valuable dog you had better consult one specially skilled in this line; ordinarily, a scant diet for a day or two, and then a good purgative would do. 2. How many pounds of blood does a bullock average on being slaughtered for each 100 pounds he weighs, and what would the blood be worth per pound as a refuse product, and what would be the best manner of disposing of same. A. The amount of blood varies widely; it is mostly used to make a fertilizer, and some of our New York butchers give it away to boys, who save it, for the incidental service they do. It would take the blood of a half dozen ordinary bullocks to make a barrelful.

(12) J. E. H. asks: Suppose I have a wild goose and a tame goose together, and the two produce offspring; will their offspring propagate, and if so, which side would they naturally incline to? A. Crosses between wild and tame animals of the same species have

been made with success. All of our domestic birds, fowls, and animals were in the early ages in a wild state. It is very uncertain as to which side they would naturally incline at first, but confinement, or the clipping of the wings of those disposed to fly away, would probably determine their permanent disposition to the tame state definitely.

(13) A. C. P. F. asks (1) a receipt for making birdlime. A. Bird lime is made as follows: Boil the middle bark of the holly 7 or 8 hours in water; drain it, and lay it in heaps in the ground covered with stones for two or three weeks, till reduced to a mucilage. Beat this in a mortar, wash it in rain water, and knead it till free from extraneous matters. Put it into earthen pots, and in four or five days it will be fit for use. An inferior kind is made by boiling linseed oil for some hours, until it becomes a viscid paste. 2. A cement for mending broken flint arrow heads, and that will fasten arrow heads to wood securely instead of wiring them on as some do? A. The following is used for mending fossils and minerals, and will answer, we think, both for the mending and attaching the arrow heads:

- Starch.....2 drachms.
White sugar.....1 ounce.
Gum arabic.....2 drachms.
Water.....q. s.

Dissolve the gum, add the sugar, and boil until the starch is cooked. 3. Does the earth increase in bulk, or is it no larger than at time of cooling process? A. We refer you to Professor Young's paper on the Growth of the Earth, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 40, where data are given to show exactly how much the earth has increased in size.

(14) C. A. B. asks: 1. How can I temper coiled steel wire springs so that they will not break under a small pressure or pull? A. A good way to temper small coiled wire springs, as practiced in factories where much is to be done, is to heat an iron pot filled with lead so that the lead is a full red or sufficiently hot to heat an immersed spring to the requisite temperature for hardening, which can be done by quickly immersing the hot spring in water or lard oil. Then for drawing to a spring temper heat a small vessel of linseed oil to its boiling point. Dip the springs in the boiling oil for a few seconds (time according to thickness), and plunge them into cold oil. 2. How may I apply black varnish to iron pipes and steel springs so that it will not peel or scale off? A. For varnishing iron pipes and springs use good Japan varnish, a thin coat well baked at 270°. If it proves brittle, mix a little boiled linseed oil with the Japan varnish.

(15) A. M., referring to polished sheets of stove pipe iron being found in a ball of rough ones, writes us that, in making sheet iron of the higher gauges, it is necessary, in order to obtain the required thickness, to roll two or more sheets together. To make 22 gauge it is necessary to roll 4 sheets together; 24 gauge, 5 sheets. These sheets rolled together are called a pack. The top and bottom sheets of a pack, being the ones which come in contact with the rolls, always have a polished surface on one side, while the inside sheets are rough. The manufacturers do not consider these inside or rough sheets of an inferior quality.

(16) E. N. P. asks: 1. Has the cylinder of a phonograph got to be just so large for the machine, or will it make any difference if it is larger or smaller? A. The size is immaterial. 2. What does the piece of rubber tubing rest on, and is it a ferrotape that is put between two pieces of blotting paper? A. The piece of tubing is placed between the inner surface of the mouth piece and the diaphragm. The diaphragm may be made of ferrotape plate. 3. How is the piece of rubber fastened on? A. With cement although it will keep its place without any special fastening. 4. Is the cylinder to be hollow or solid or is there any difference? A. Either solid or hollow. The solid is preferred, as it acts as a fly wheel to equalize the motion.

(17) W. C. W. asks (1) how to make an induction coil. A. Consult SUPPLEMENT No. 160. 2. Also how many 2 quart Daniell cells would be necessary to run an incandescent lamp of 15 candle power? A. It would take a large number of Daniell cells to operate an incandescent lamp. Better use forty or fifty Bunsen cells. 3. Please state the length of the primary and secondary wires in the coil, also their size. I would like one strong enough to make a spark about two inches long. A. See SUPPLEMENT referred to above.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

V. W. H.—We presume the specimen to be tourmaline. It is so very small that it is difficult to determine it positively without an analysis.—C. W. N. K.—The specimen is a sulphide of iron containing arsenic, and is known mineralogically as arsenopyrite.

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June 17, 1884,

AND EACH BEARING THAT DATE.

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