

## 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.

## Business and Personal.

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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 &amp; 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 casehardening 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, submerge 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,