ENGINEERING INVENTIONS.

A rotary engine has been patented by Mr. Frederick H. Crass, of Murfreesborough, Tenn. This invention consists in a peculiar construction and arrangement of a revolving outer casing bearing piston and exhaust ports, combined with a stationary steam chamber and cut-off gates or slides.

A sand feeder for locomotives has been patented by Mr. Hampton R. Campfield, of Susquehanna, Pa. Combined with the sand box and its discharge pipe is a feed box, with a handhole, so arranged that the sand will be delivered regularly and in uniform quantities, and so that pebbles, coarse sand, or refuse will not be liable to clog the outlet groove.

AGRICULTURAL INVENTIONS.

A cornstalk cutter has been patented by Mr. George A. Stone, of Richmond, Mo. Combined with a frame are pivoted levers carrying pivoted chopper bars, with other novel features, making a machine which, as drawn along a row of stalks, will cut them into short lengths, which may be readily plowed under; the machine can also be made narrow to cut a single row of stalks, or wider to cut two rows of stalks at a time.

A thrashing machine has been patented by Mr. Thomas J. Widemire, of Grampian Hills, Pa. It is for thrashing grain in such manner that the straw will not be ruined or broken any more than it is by hand thrashing, the grain to be thrashed being placed upon a table of the machine, and beaten by flails, which after striking it slide off, are carried around by a wheel, then strike again, and so on.

MISCELLANEOUS INVENTIONS.

A ribbon and braid holder has been patented by Mr. Charles M. Stone, of Belton, Texas. This invention consists of a peculiar shaped wire holder easily adjusting itself to the diameter of the roll and ribbon thereon, so the ribbon may be wound smoothly and evenly, and the end will be held to prevent unwinding.

A device for fitting cross cut saws has been patented by Mr. William H. Dessureau, of Otsego Lake, Mich. It is a combination tool, adapted also for use as a screw driver, measure, and hammer, and by which, in connection with a file, a saw can be easily and accurately fitted.

A surgical instrument has been patented by Mr. John S. Poynor, of Walnut Springs, Texas. In a headed rod a series of springs is held with their inner ends to turn in such a way as to make an improved device for extracting foreign bodies from different parts of the body, and one which can also be used as a probe.

A tag or label has been patented by Mr. Samuel M. Guss, of Reading, Pa. It has a pin secured by a button, the eye passed through the label, with a washer and guard for the point of the pin, making a tag which can be readily carried in the pocket, and, with suitable printing matter, will be convenient to attach to goods, secured seats, etc.

A clasp has been patented by Messrs. Charles F. and William J. Walters, of Prospect, N. Y. It is formed of two flat jaws made integral with a cross-piece uniting them combined with a latch pivoted on one jaw and having a curved slot through which a pin passes from the other jaw, making a device for holding stockings, shirt sleeves, or parts of garments.

A nail tongs has been patented by Mr. Woodson Mosley, of Kingsland, Ark. A pair of pivoted hand tongs has a hook secured to the under side of one of the levers for retaining the handle of a scoop, so that a greater quantity of nails can thus be removed at a time from nail boxes or nail trays and the dropping of the nails prevented.

An end gate fastening has been patented by Mr. Duncan W. McKinnon, of North Sydney, Nova Scotia, Canada. Combined with the gate is a rod or shaft with lateral hooks engaging with the braces on the sides of the wagon body, the shaft having a lug acted on by a spring of the gate, making a simple and strong fastening for the end gates of wagon boxes.

A cuff button has been patented by Mr. Elias M. Stewart, of Richmond, Canada. Combined with a hollow head having a tubular shank with a cross piece, a pin is arranged to turn in the shank, with a cross piece on the pin, a sliding rod through the upper end of the pin, and a head on the outer end of the rod, the head having a rib for locking the rod in place.

A milk and water cooler has been patented by Mr. Edward Williams, of Lynn, Mass. It consists of a can with two compartments, separate faucets and covers, with handles and trunnions on the outer side of the can, making a can in which the ice employed for cooling is not brought in contact with the liquid to be cooled.

A water motor has been patented by Mr. Horace L. Walker, of Ottumwa, Iowa. It works in connection with an overshot water wheel, combined with which is a series of double acting pumps, which rotate with it, there being weights attached to levers for working the pumps, and cranks connected to the pump pistons and to the levers.

A vehicle wheel has been patented by Mr. Charles W. Long, of Eaton, O. Combined with a circular rim is a frame mounted to turn within it, making a wheel without a hub, which can be used as a master wheel on reapers or for other purposes, making the reapers run more easily, the draught less, and giving more power.

A fence post has been patented by Mr. William H. Gates, of Jesup, Iowa. The invention consists in particular constructions of the posts, combining therewith base plates or ground anchors of peculiar form, and in the connections of the horizontal fence wires or rails with the fence posts, to facilitate the erection and lessen the cost of such structures.

A ladder has been patented by Mr. Robert Furlong, of Saucelito, Cal. It is for house or orchard use, and is adapted to support a platform when desired, the invention consisting in the combination, with two pairs of bars pivoted at or near their middles, of rungs uniting one pair of bars and cross bars, and braces uniting the other pair.

A jointed gas and lamp bracket has been patented by Mr. Henry P. Drew, of New York city. Combined with chains and swinging arms of a bracket are an adjustable guide bar and stops, so the swing of the outer arm will be limited independently of the position of the inner arm, the invention being an improvement on former patented inventions of the same inventor.

A sash holder has been patented by Mr. William D. Isett, of Altoona, Pa. Combined with a frame are two friction disks mounted independently and eccentrically on a shaft, with cords and pulleys for turning them, making a device for locking sashes so they cannot be raised or lowered from the inside or outside, the device being readily manipulated from the floor of the room.

A strap holder has been patented by Mr. Robert L. Beaumont, of St. Joseph, Mo. It is formed of two sections hinged together at one side, and having catches on their opposite edges, there being also a hinge or joint wire having snap hooks formed on its edges, the device being for holding a strap, cord, or chain when not in use, or as a grip or handle for packages or bundles.

Drafts, checks, and other money orders form the subject of a patent issued to Mr. William T. Doremus, of Flatbush, N. Y. It is made with spaces for the place, date, and name of drawer, order and name of payee, dollar sign, numerals from 0 to 9, fraction signs, etc., so that such checks, when filled out, will necessitate too many erasures and changes to be successfully "raised."

Neckwear forms the subject of a patent issued to Mr. Edwin D. Smith, of New York city. This invention consists in an embossed scarf, bow, or cravat, made of paper, with devices for holding it in place on the collar button, the goods being capable of being produced in black or colors in imitation of silk, calico, or other fabrics, and so as to simulate the creases and folds of a variety of materials.

A fire escape has been patented by Mr. Isaac S. Smeltzer, of Columbus, Ohio. Two grooved pulleys are mounted on a shaft journaled in brackets projecting from the wall of a building, persons to be rescued may take hold of rungs and step on platforms, which will descend while other parts of a cable are rising, or firemen and hose can also be elevated to the upper stories of a building.

A hedge trimmer has been patented by Mr. William McLaughlin, of Auckland, New Zealand. It is made with a carriage and a disk having two or more cutters, connected with the drive wheel of the carriage by two pairs of beveled gear wheels and two shafts, whereby the disk will be driven at great speed by the advance of the machine, making a mechanism adapted for cutting brush and trimming hedges.

A hat and bonnet fastener has been patented by Mr. James L. Umbellar, of Kankakee, Ill. It consists of a hook or combined hook and elastic cord fastening, designed as a substitute for the ordinary cords or bands usually sewed on ladies' hats and bonnets, making a fastening which is conveniently attached, may be readily renewed, and is adjustable to secure a good fit and hold without sewing on the hat or bonnet.

A door bolt has been patented by Mr. John F. Taylor, of West Park, N. Y. It is made with a bar adapted to slide and be turned axially, and with a cam or eccentric lug, and held to the door so its lug may enter a recess for holding the bar, so that the door will be held closely to its casing or seat without regard to variations in size of door or casing caused by changes in temperature or the weather.

An apparatus for purifying water has been patented by Mr. Robert H. Thurston, of Hoboken, N. J. By this invention air or purifying gas is introduced under pressure into the rising main or delivery side of a pumping system, for aerating the water supply, for oxidizing all substances that are oxidizable, and thus purifying the water supply of cities and towns that are supplied with water under a head or pressure.

A stop attachment for roller skates has been patented by Mr. Josiah P. Geran, of Brooklyn, N. Y. It is made with a curved plate having strengthening flanges, a recess, and a flexible block secured in the recess of the curved plate by a clamping plate, making a device by which the advance of skaters can be readily checked, and which will serve as a safeguard to prevent the skater from falling backward.

A wire rod rolling mill has been patented by Messrs. Henry Grey and Richard Bowater, of Beaver Falls, Pa. It is for reducing heated rods to prepare them to be drawn into wire, and provides a special construction and combination of parts to avoid the use of wabbler connections and of gearing between the rollers, as well as to afford means for supplemental heating of the wire rod during the process of rolling.

A life saving apparatus has been patented by Mr. Olney Arnold, of Pawtucket, R. I. Combined with a kite is a small boat, carrying a spool or bobbin with a life line, one end of which is made fast to the ship while the kite is made to drag the boat to the shore, the boat being so made as to adapt it to increased or diminished resistance in the water, and so it can be guided out of alignment with exact direction of the wind.

A nut lock has been patented by Mr. Louis Brandt, of Salina, O. Combined with a fish plate, a screw bolt and nut fitted thereon, and a projection forward of the face of the plate, is a block fitted to an angle of the nut and filling the space between the nut and projection, with another screw nut so placed and weighted as to retain the block between the nut proper and the projection.

A slicer has been patented by Mr. Daniel J. Gilchrist, of Newark, N. J. Combined with a slide carrying a blade is a board held to the slide by links and an angle lever, a rod being connected with the angle lever by means of which the board can be moved a greater or less distance from the edge of the blade, and the device readily adjusted to cut slices of any desired thickness.

A wagon box fastener has been patented by Mr. John A. Jonas, of Reserve, Kan. Combined with a wagon box having bars with heads on the upper end of the inner surface is a false box with spring straps provided at their lower ends with hooks which can catch on the heads on the rods of the box, the spring fastener being tightened by the pressure of the load against the false box.

A two wheeled vehicle has been patented by Messrs. Joseph F. Sanders and Theophilus T. Whitcomb, of Elizabeth City, N. C. Bed plates are fixed at or near each end of the axle, having grooves forming seats for the shafts and the springs or their bed blocks, whereby the height of the shafts may be regulated, and a simple connection is made of the spring and shaft to the axle, making a device especially fitted for the running gear of two wheeled vehicles.

A washing machine has been patented by Mr. Peter Lawson, of Moline, Ill. A washing wheel journaled to revolve in a tub has on its periphery a series of eight-sided rubbing rollers, and against these is held by a board and frame, with a spring, a roller somewhat larger, between which and the smaller rollers the clothes are drawn or made to pass by the turning of a crank, giving a quick and thorough rubbing motion with little liability to a tearing action.

A combined burglar alarm and sash fastener has been patented by Mr. John Brady, of Philadelphia, Pa. A bar with bolt holes is attached to the front of the upper sash, and a toothed bar to the front of the lower sash, and a spring bolt is arranged in the window frame to move parallel to the sash and engage with the toothed bar, making a locking device as well as an alarm when the window is opened from the outside.

A tricycle has been patented by Messrs. Theodor R. A. Weber, of New York city, and Carl E. E. Hennig and Alfred E. Frommelt, of Paterson, N. J. The main wheels have sprocket wheels connected with sprocket wheels on the forward treadle shaft, in combination with sliding clutch blocks, there being two treadle shafts which work together, but so placed that the treadles of one will be horizontal while the other is vertical, with various other novel features.

A machine for straightening match splints has been patented by Mr. William H. Wyman, of Oshkosh, Wis. Combined with a partition shaker is a partition box held in the bottom of the same, whereby the splints are caused to turn and move until they drop lengthwise into compartments formed between the partitions, whereas heretofore the splints were straightened by the machine and then placed by hand in the box.

A vehicle wheel has been patented by Mr. William Gibby, of Rahway, N. J. The hub box has exterior screw threaded and tapered longitudinal grooves, the hub sections sliding upon the hub box and having radial slots in their outer parts to receive the spokes, etc., so that the wheels can be adjusted to cause vehicles to track wider or narrower, to tighten or slacken the rims, and allow part of the wheel only to be removed and replaced.

A button or stud has been patented by Messrs. Read Benedict, of New Brighton, and Harry M. Scott, of Brooklyn, N. Y. It has a twisted shank with attached plate, whereby the plate or bottom may be easily inserted into a button hole in a garment, the button shank and plate being formed together of a single piece of sheet metal bent into form to be soldered or otherwise secured to the bottom or under side of the button proper.

A shirt has been patented by Mr. Nathan Roggen and Toba Eisenstein, of New York city. The yokes extend from the back placket along the neck piece, thence directly over the shoulder seams, and they are each formed with side points, which follow down the shoulder seams front and back, to strengthen and re-enforce the shirt at the shoulder and prevent the seams from giving away from wear of the coat, vest, and suspenders.

A welding compound has been patented by Mr. Elisha Watkins, of Portland, Ore. It is made from sal ammoniac, zinc, borax, and iron filings, a specified proportion of each, and made according to certain directions, whereby it is claimed that perfect welds of iron and steel can be made at a low heat, with no risk of burning or from repeated heatings, while it is stated to be excellent for tempering and toughening.

A combined door check and buffer has been patented by Carrie G. Griffin, of Manhattan, Kan. The door check, with a pivoted hook, has a bumper with a pivoted latch or tumbler for engaging the hook, the tumbler being adapted to be turned in one direction to engage the hook, and to allow the hook to pass when turned in the opposite direction, so it may be attached to a door or wall and used either as a bumper or to keep the door open.

The setting of real and artificial stones forms the subject of a patent issued to Johann F. Mahla, of Pforzheim, Germany. The setting consists of a metal ring or piece in which hollow heads are formed, terminating in hollow jaws or claws, the latter being drawn out of the metal by punches or stamps, instead of by hand as heretofore, the claws being hollow and much stronger and stiffer than solid ones.

A core for the armatures of dynamo electric machines has been patented by Mr. Hans J. Muller, of New York city. It is a formed of a single block of metal with a series of transverse ventilating apertures extending from side to side and dividing the central portion into transverse gridiron bars, the apertures between the bars having the same cross section from the outer surface of one side of the armature core to the outer surface of the opposite side, to prevent overheating of a Siemens armature.

A quilting attachment for sewing machines has been patented by Mr. David R. Fraley, of Lexington, N. C. This invention covers a special construction and combination of parts intended to hold quilts extended while traveling to and fro to carry them across the sewing machine, holding and stretching the upper and lower cloths independently, and providing a tension to hold the quilt down on the bed and feeder so that both bottom and top cloths will be held evenly with other novel features.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

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.

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) T. H. W. J. desires (1) a paste to clean white leather belts (military), that will not rub off. A. If the belts are of a dull white, stale bread is the best preparation to use in cleaning them. If they have a gloss, use a sponge with tepid water. 2. What to clean white helmets with? A. As for the helmets, we know of no means by which they can be cleaned except by coating the soiled places with ordinary crayon chalk. A little pipe clay mixed with water would probably answer equally as well.

(2) X. Y. Z. desires a method of making paper tough and flexible. Also, can the tough paper used for flour sacks, etc., be made soft like leather or cloth without too great expense, by a chemical or a mechanical process? Is there any machine for taking out stiffness? A. The character of the paper depends largely upon the material with which it is made and also upon the amount of size worked into the mass. The "Technology of the Paper Trade" was the title of a series of articles published in the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 109, 110, 116, 117, 118, and 123, and we would refer you to these.

(3) E. H. desires a recipe for a mucilage for adhering photographs to convex glasses, for painting what is called ivorytype. The mucilage must be perfectly transparent, and not contain either dextrine or starch, or any chemical that would stain the photograph. I want a mucilage that will not sour or mould, spot or crack, after applied to the photograph. A. This information is given very fully on page 120 of SCIENTIFIC AMERICAN, February 21, 1885, under title of "Practical Method of Transferring and Coloring Photographs on Glass." 2. Would like a recipe for a preparation to be applied to the surface of zinc to kill it or remove the gloss, so that when paint is applied it will adhere firmly and not chip off. A. Use dilute sulphuric acid.

(4) J. H. N. asks if there is any way of making phosphorus hold its luminous property on paper for a week or more. Also kindly state if you know of any magnetic iron ore being found in paying quantities in western New York, west and south of Rochester? A. We would recommend that luminous paint be substituted for the phosphorus compound. The luminous property of phosphorus is due to the slow oxidation of that element giving rise to an exceedingly poisonous gas; and if the phosphorus is in sufficiently large quantity, the oxidation will increase until it bursts into flame. The two principal deposits of magnetite in New York State are, 1, those of the Adirondack region and, 2, those located in the southeastern portion of the State. There are no worked deposits of importance in the region mentioned by you.

(5) L. S. asks (1) how to clarify rosin to render it either transparent or a nice white color. A. You can dissolve rosin in ether or benzol; filter the mixture, and allow the solvent to volatilize, and then you will have the rosin freed from mechanical impurities. 2. How to produce wax similar? A. Beeswax is bleached by exposure to sunlight in thin cakes. 3. If there is a compound cheap and good, white or transparent, fusing similar to rosin and setting hard and tough? A. Try paraffine. 4. How to treat moulds in which rosin is run so that it won't adhere to the mould? A. Covering the contact surfaces in the mould with pure glycerin is recommended.

(6) A. C. D. writes: The air saturated with vinegar fumes seems to destroy the strength of the lime in plaster, and it is constantly falling in dust and sand. I wish to use some ingredient in the mortar which will not be susceptible to a vinegar atmosphere, and make the wall permanent. A. Quicklime and linseed oil mixed stiffly together form a hard cement, resisting both heat and acids. A stiffly mixed paste of pipe clay and coal tar is also used. Coating the wall with waterglass or sodium silicate is excellent; the silicate will combine with the lime, and form a calcium silicate which is as hard as stone.

(7) W. H. writes: I have a large mirror, the back of which has from cause unknown to me become spotted, looks as if was smoked or rubbed; now, where can I have it repaired, or how can I do it myself? A. It may be necessary to resilver the entire mirror, but if the injured localities are not too extensive, the following plan will answer: Pour upon a sheet of tin foil about 3 drachms of quicksilver to the square foot of foil. Rub smartly with a piece of buckskin until the foil becomes brilliant; lay the glass upon a flat table, face downward; place the foil upon the damaged portion of the glass; lay a sheet of paper over the foil, and place upon it a block of wood or a piece of marble with a perfectly flat surface; put upon it sufficient weight to press it down tight; let it remain in this position a few hours. The foil will adhere to the glass.

(8) R. T.—The practice for sizes of safety valves varies somewhat to suit the trade sizes of pipe and fittings. One square inch opening in safety valve for each 5 horse power (nominal) is a fair average for stationary boilers. By Act of Congress, for cylindrical boilers, 24 square inches area is required for each 500 square feet of effective heating surface, for marine use. For obtaining the distance of the ball for a given pressure: Divide the weight of the ball by the area of the valve, and divide the required pressure by the quotient. The last quotient will be the distance of the center of the ball in parts of the distance of valve stem from the fulcrum. As in your case

$$\frac{\text{70 lb. weight}}{\text{7 sq. in. area}} = \frac{\text{90 pressure required}}{\text{10 1st quotient}} =$$

9 times the length of the leverage; then 9x2¾ inches= 24¾ inches whole length of lever from fulcrum to center of ball. As 24¾ inches less 2¾ inches=22 inches, and as you do not give the weight of the lever and valve, we apprehend that 1 inch may be allowed for their weight, and that your safety valve is set for 90 pounds pressure.

(9) M. K. B.—The sputtering of molten metal is caused by dampness or water. If cast in a metal mould, heat the mould hotter than boiling water.

(10) E. C. asks how to cut off steam gauge glasses. A. Take a small round file, and break a small piece off the end to give it a sharp edge. Pass the end of the file into the tube, and press the sharp edge of the file on the glass at the place to be cut, turning the glass so as to cut entirely around it, when it will be found to break by a gentle pull. If the place to be cut cannot be reached in the first cut, make two cuts. Or you can make a slight cut all around with a file, putting a little turpentine previously over the place to be cut.

(11) A. G. S. asks whether it is possible to put iridium on edged tools so as to hold the edge for a longtime without getting dull; also, if it can be done, the address of any concern that can do it. A. Iridium pointed tools will not do to turn hard steel or even cast iron, as it is too brittle, but for pearl, bone, rubber, or celluloid it has been proved to do ten times the amount of work done with a steel tool before it becomes dull. The iridium pointed tool costs about three times that of a steel tool. The tools are made by the American Iridium Company, of Chicago, of which John Holland is manager.

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July 7, 1885,

AND EACH BEARING THAT DATE.

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