## ENGINEERING INVENTIONS.

A traction engine has been patented by Mr. John E. Birch, of Winnipeg, Manitoba, Can. The object is to furnish a practical machine for road or farm work, and so, by special devices, the engine carries and takes up an endless track. By this means an extensive bearing surface is obtained for carrying the engine over soft or spongy ground, without danger of miring.

An improvement bearing on the present manner of heating railway cars has been patented by Mr. Michael Hurly, of Quebec, Canada. The invention relates to safety couplings for connecting steam conducting pipes, the two sliding parts of the coupling being connected together by a spiral spring, to secure a more perfect steam tight joint, etc.

A railway car truck has been patented by Mr. James E. Squire, of Glencoe, Ontario, Canada. Its construction is such that the load rests upon the periphery of the wheels in succession as they come under the treads, thus diminishing friction; the wheels are intended to turn only half as often as ordinary trucks with the same speed, so that less oil will be required and there will no danger of hot boxes.

A mine shaft elevator has been patented by Mr. Michael S. Coleman, of New York city. The carriages travel upon guide ropes extending down the shaft and are provided with means for readily attaching and detaching or tightening and slackening the ropes, and the arrangement is such that the elevator appliances may be conveniently and speedily removed when blasts are to be fired.

A grain car door has been patented by Mr. Benj. H. Gatton, of Bath, Ill. It is to be used inside of and together with the ordinary door, and is made of boiler plate or other suitable material of sufficient thickness to have ample strength for resisting the pressure of the grain. It is run in a groove along the door sill, opening sideways, and extends into the space between the outer and inner casings of the shell of the car body.

A car coupling, with a laterally swinging coupling hook pivoted to a rod secured to a buffer frame on the bottom of the car, has been patented by Mr. Chancey C. Haskin, of Waltham, Ia. A lever pivoted on the car has a curved arm with a bent end, which passes into a recess in the inner side of the coupling hook, and this lever is connected with an upwardly projecting lever swinging in a slot in the car floor.

A spark arrester for locomotives has been patented by Mr. Joseph Meier, of Plainfield, N. J., in which the smoke stack has two concentric tubes and two screens, with apertures in the inner tube, above and below the lower screen, and with an annular partition below the apertures below the lower screen, and within the space between the two tubes, whereby the sparks will be arrested and drop down through the middle tube into the smoke box.

An improved railroad rail joint has been patented by Mr. Jacob E. Moeller, of Centralia, Ill. This invention relates to that class of rail joints in which the chair is assisted by other parts to hold the ends of two contiguous rails in line, which is effected principally by a peculiar manner of applying and the shape of the fish plates, which are so placed as to brace from a seat between the chair and the base of the rail and the angle where the head and the web of the rail join, all to prevent lateral or spreading strain or longitudinal slip.

An improved eccentric spring car brake has been patented by Mr. James O'Donnell, of San Francisco, Cal. An eccentric spring brake disk is combined with a frame pivoted below the car floor; in this frame the shaft is journaled on which the brake disks are mounted, and on this shaft are two clutch pulleys, one of which is revolved by a chain or belt from one of the axles. The clutch pulleys are pressed together by a powerful spring when the brake disks are lowered, and thereby the brake disks are conpled, and the shaft carrying the brake disks is revolved. As soon as the shaft is raised a beveled wheel separates the clutch disks, and the shaft carrying the brake disks will no longer be revolved.

## MECHANICAL INVENTIONS.

An improved machine for bending metal or strips to form kettle handles, roof cleats, etc., has been patented by Mr. Thomas R. Freeman, of Sioux Falls, Dakota Ter. It can be adjusted for bending roof cleats for flat seams or standing seams, or to make flanged angular plates of any desired angle.

An improvement in the manufacture of anger bits and other boring tools has been patented by Mr. George F. Stearns, of Chester, Conn. A malleable metal square shank and tang is first formed in one piece, with a recess to receive the round shank, then the square shank is welded to a round steel shank, and the thread is cut on the tang.

An improved compound metal working machine has been patented by Mr. Gilbert McDonald, of Georgetown, N. M. It is a peculiar construction and combination of devices in a metal punch or shears, to facilitate work on hot or cold metals, with a minimum of applied power, due to the improved compound lever and eccentric devices employed.

An attachment for a watchmaker's lathe more particularly, or for supporting, steadying, and working small articles, and to facilitate the accurate turning and drilling of the same, has been patented by Mr. Herman M. Potter, of Williamsport, Pa. It combines in one device an adjustable dead center and an adjustable countersunk center.

An improvement in well drilling machines has been patented by Mr. Thomas J. Hathaway, of Montevallo, Mo. The machine here provided for is arranged on the bed frame of a wagon, and the drill and the rope are turned by the rotation of the turn table for working the drill, the length of the stroke being the same whether the team goes fast or slow. A great saving of time and labor is also effected by the arrangement of the drill to be worked on the wagon bed, without unloading or taking apart.

An improved scraper and elevator has been patented by Mr. Titus H. Apple, of Evansburg, Pa. An elevator trough is journaled to swing on the fore part of a sled or wagon, the lower end of which can be tipped down to rest flat on the ground and form a scraper. Transverse shafts are journaled in this trough at both ends, on which are sprocket wheels, carrying endless chains, to which are attached scraper blades. At the upper end there is an opening in the bottom of the trough through which the dirt, snow, dust, stones, etc., carried up by the scraper may be discharged into the wagon or sleigh.

## AGRICULTURAL INVENTIONS.

A combined land roller and clod crusher has been patented by Mr. Andrew Helman, of Winfield, Kas. The invention consists of a combined land roller, clod crusher, and harrow. Three parallel upright plates are connected by jointed shafts carrying rollers, circular cutters, cultivating teeth, and scrapers, so the ground will be smoothed, the clods crushed, and the soil loosened.

An improved double harrow has been patented by Messrs. Edmund L. Nash and Benjamin R. Pennybacker, Jr., of Parkersburg, W. Va. The rod to which the sections are hinged has the bent portion at its forward end, the double tree loosely connected to said rod, and spring draught attachments connecting the ends of the double tree with the centers of the said sections.

An invention in sulky plows to prevent the tongues from springing down, make depth of plowing more uniform, and increase the durability of plows has been patented by Mr. Seymour K. Seelye, of Hudson, Mich. The idea of the construction is, the sections of tension rod are jointed directly under the joint of the pole, so that both may be turned together laterally and correspondingly.

An improved potato digger has been patented by Mr. John Shannon, of Wixom, Mich. From a two wheeled truck a shaft is extended to the rear, which carries curved prongs or teeth that, with the rotation of the axle, are made to dig up the potatoes in about the same manner as they would be dug by a fork. The digger shaft revolves about twice as fast as the axle, and has a gathering attachment and conveyer.

An improved riding harrow has been patented by Mr. Thomas L. Cone, of Brest, Mo. The frame has duplicate sections hinged together, which permit of up and down motion independent of each other. The seat board has a double attachment so that the weight of the driver will come where the harrow would otherwise do the lightest and poorest work, thus making it more effective than ordinary harrows.

A combined harrow, roller, seeder, and cultivator has been patented by Mr. James D. McKinnon, of Portland, Ore. The harrow teeth are bent upward and backward with reference to the direction in which the harrow revolves, to beat down and pulverize clods to the best advantage, but the teeth are screwed into the cylinder so they can be changed for another form for different kinds of work, and the harrow may be raised or lowered or suspended above the ground. There is a detachable roller shell, and over the harrow is a seed hopper, in which a rotary seed dropper may be arranged.

## MISCELLANEOUS INVENTIONS.

An improvement in composition for gilt mouldings has been patented by Mr. Louis Eberle, of Altoona, Pa. The composition consists of stick lac, sandarac, galipot, gamboge, dragon's blood, and alcohol.

Mr. Hugh Pound, of Portage, Wis., has patented an improvement in slop buckets. The construction is such that the bucket may be filled or emptied without entirely removing the cover, and the cover is made self-closing, so that the bucket is very convenient and at the same time cheap and practical.

An improvement in base balls, or balls for any games where they are subjected to rough usage, has been patented by Mr. William B. Melot, of Fleetwood, Pa. It consists in having the cover fastened upon the ball by stitching which is entirely upon the inside, and is not exposed or apparent upon the exterior at all.

An improved pipe wrench has been patented by Mr. Conrad D. Volkmann, of Nappanee, Ind. It is of that class of wrenches adapted to engage the surface of a round bar of iron or pipe and turn the same when moved in one direction, but to disengage itself when moved back. Its peculiarity consists in having a jaw of special form opposed by two smooth movable jaws.

An oversboe for horses has been patented by Mr. James W. Smith, of Jersey City, N. J. Its object is to prevent the slipping of horses on icy and slippery roads and inclines. The shoe has heavy and strong steel edged calks, and can be buckled on or removed very quickly; it affects no change in the use of the usual horseshoe.

An improved bag and twine holder has been patented by Mr. Walter R. Poage, of Shelbyville, Mo. It consists of a suspended ring or disk of metal or wood, and having a series of horn-shaped prongs projecting therefrom, for suitably suspending paper bags, and also a twine holder in connection therewith, for conveniently suspending the bags and twine over the counter.

A toy kitchen forms the subject of a patent which has been issued to Mr. Max Miller, of Brooklyn, N. Y. The invention covers a toy kitchen with a tank held removably to the side, and water can be drawn therefrom by pressing the knob of a faucet without shaking and jarring the toy kitchen, and throwing down the dishes, and avoiding to a great extent the splashing and spilling of water.

A tricycle has been patented by Mr. Henry K. Shauck, of Dayton, O. The improved construction is intended to better adapt the vehicle for general use. The axle is connected to the yoke of the guide wheel by a low pendent frame and goose neck, thus forming an open sided vehicle specially convenient for women, and one that can be used to advantage by persons of but little physical strength.

An automatic stop plug for gas pipes has been patented by William F. Cosgrove, of Jersey City, N. J. The object of the invention is to prevent the flames in burning buildings from being fed by gas from escaping gas pipes, which is effected by a particular arrangement of a screw and fusible nut, so that, should the temperature rise above the melting point of the nut, a plug will drop and close the passage automatically.

An improved neck yoke for double teams, to support and guide the team pole, has been patented by Mr. Joshua W. Harris, of Waynesborough, Va. Its object is to provide means whereby a yoke of the required strength may be made lighter and of a smaller piece of lumber, collars being driven on each end of the neck yoke in lieu of cut rings and secured by screws, and the clasp being dispensed with.

An improved door check has been patented by Mr. William H. Herrick, of Grinnell, Iowa. A spring bar or strip has one end fast to the bottom edge of the door and the other resting on the floor, the free end being provided with a cushion to produce friction; this free end can be held from the floor, and to the bottom of the edge of the door, in case the door holder is not to be used.

A process of laying pavements has been patented by Mr. William McLean, of Los Angeles, Cal. It relates to that class of pavements usually made of concrete, and provides means whereby encaustic tiles, or tiles and stones, may be laid in combination with concrete, for sidewalks or other pavements, the intention being that each section shall form one piece, so that shrinking will not change its level relative to contiguous sections.

An improved fence has been patented by Mr. Grant M. Wadsworth, of Sugar Grove, Pa. It combines, with diagonal cross bars, a metallic plate nailed to and between said bars and projecting above their junction, to form a support for one end of a top rail; there is a bottom cross tie, and top and bottom stringers notched to fit over said plates. Wires may also be used in the construction, for which a suitable straining device is proposed.

A storm coat of special design forms the subject of a patent which has been issued to Messrs. William P. Dodge, of Prospect, and John Cummings, Jr., of Utica, N. Y. The coat has a lap or apron made a part of the front opening, and adapted to be folded and buttoned on the inner surface of that side to which it is fastened, or to the other side after having been passed over the front of the body, thereby affording better protection against rain or snow.

A marine drag has been patented by Mr. Ambrose J. Clarke, of Brooklyn, N. Y. It has a shank provided with stationary runners, to which are hinged the ribs and a movable runner, to which are attached the stretchers. The ribs and stretchers are hinged to each other, and to the ribs are hinged the edges of triangular plates, having the other edges of the adjacent plates hinged to each other, so the drag will be opened by the resistance of the water.

An improvement in two wheeled vehicles has been patented by Mr. John C. Bach, of Hillsdale, Mich. This invention is designed to meet a want widely felt since two wheeled carriages have recently become very fashionable. The body is so pivoted as to oscillate at its rear end, and a centrally arranged spring is so made to operate that the body is protected from the swing of the horse, so as to prevent the forward and backward rocking motion of the rider.

An improved saw tab has been patented by Messrs. John D. Ryan and Paul Lane, of East Saginaw, Mich. It is for use with gang and other saws for connection of the buckles used in stretching the saws, and can be applied without the rivets now required; also when in place the strain is not upon the rivets, but on lugs of ample strength; it may likewise be removed easily without injury, being practically indestructible by ordinary use.

An invention to facilitate the bottling of liquids and prevent waste thereof has been patented by Mr. Alfred Rigny, of New York city. The faucet has a tube to enter the bottle, with a valve at its lower end attached to rods passing up the outside of the tube, and connected with a sliding collar, so the valve can be readily opened and will be automatically closed. Means are also provided for the free escape of air as the bottle is being filled.

A hotel and burglar alarm electric annunciator has been patented by Mr. Wm. S. Corwin, of Newark, N. J. The annunciator has a crank shaft with fingers, so all downdrops can be raised at one operation. The shaft is automatically brought back to proper position. The electric connections are such that the current can be made to cause continual ringing of the bell without effecting the magnets and drops, and one part of the apparatus can be tested without affecting the other.

A micrometer calipers has been patented by Mr. Leopold L. Remacle, of New York city. While it can be folded compactly and used to measure considerable spaces, it will likewise measure twentieths and thousandths of inches. A screw works longitudinally in a U-shaped frame, and the rimmed head of the screw is divided into measures; against this head, when the calipers are in use, is brought down a pivoted straight edge rule. The pitch of the screw being one-twentieth of an inch, and its rimmed head being marked off into parts, any required measurement as low as thousandths of an inch can be readily obtained.

An improved ice cream freezer has been patented by Mr. Dudley W. Curtis, of Pomeroy, Ohio. An outer cylinder, which may be surrounded by ice, holds the cream; in the larger cylinder is placed an inner ice cylinder, pivoted at the bottom and held in position by an annular head at the top. At the sides of this inner cylinder are arms or wings, which, as the former is rotated, prevent the cream from freezing in lumps. These arms may be rigid, but preferably are made so that, rotating in one way they will fold against the cylinder, for convenience in withdrawing the ice chamber, while by turning the other way they will divide up the cream.

## 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.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) W. H. N. asks (1) how to blue the locks and metal parts of rifles such as they are blued when new, and also how to color the rifle barrel a solid blue color. A. If the articles are small, heat them in a sand bath until they attain the desired color. They will not color evenly unless well polished and thoroughly clean. Sometimes articles are heated until they pass the blue color and become gray, they are then cooled and heated again until the desired blue tint appears. 2. Are there any small electric motors made, run by a battery that are suitable to run sewing machines and such light work? If so, inform me about amount of battery, required. A. You will find a small electric motor advertised in our columns. It is driven by a six cell bichromate battery.

(2) F. C. R. asks how curled hair is made, that is, hair that is used for hair mattresses; how the curl is put into the hair. A. Hair for curling is twisted very tight into a rope of one strand, then steamed or boiled for a short time, rinsed in hot water enough to clear of dirt and stain, then dried in an oven. Then left a short time to set, when it is ready for the market and picking.

(3) F. H. B. asks: 1. Is the sun at noon half way between sunrise and sunset? Is the shadow caused by the sun shining against an upright post on earth always in the same direction at noon? By noon I mean 12 o'clock sharp. A. The shadow from your upright post, as also upon all sun dials, varies with the seasons. In your almanac you will observe a record through the various months of "sun slow" "sun fast," with the amount in minutes which you must apply in observing the noon mark upon a sun dial or its equivalent, the shadow from the post. If your horizon is level, the sun will mark true noon on the dial on four days in the year, viz., 25th December, 16th April, 16th June, 1st September, at half way between sunrise and sunset. The sun is now (November 10) about 16 minutes too fast, so that it arrives at the meridian or noon mark 16 minutes before 12 M.

(4) C. H. asks if there is anything in existence for soldering which will not cause rust afterward. Acid and ammonia will produce rust after soldered even if washed off, etc.; sometimes it will rust again, especially on anything like polished iron or steel. A. Dip the articles after they have been soldered into boiling water for several minutes. Then wash off in cold water, and we think the difficulty you mention will be obviated.

(5) C. W. asks how to make a good and cheap cherry stain for wood. A. Take 3 quarts rain water; annatto, 4 ounces; boil in a copper kettle till the annatto is dissolved, then put in a piece of potash the size of a walnut; keep it on the fire about half an hour longer, and it is ready to bottle for use.

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