

## ENGINEERING INVENTIONS.

A device to prevent nuts of rail bolts from being loosened by continued vibrations has been patented by Mr. Walter B. Johnson, of Waterloo, Ind. A metal strip that will fit between two adjoining nuts is riveted to the outer surface of a washer plate, and is held a short distance from this plate by a small block. The bolts of the nuts to be locked pass through the fish plates and rail, and rubber washers interposed between the washer plate and the fish plate. The ends of the metallic strip are then pressed against the washer plate, and the nuts are firmly screwed on the rail bolts, and the ends of the strip are then drawn outward, so that it will be straightened. If the nuts loosen they will strike against the ends of the strips and the rotation will be prevented.

An improved car coupling has been patented by Mr. Sylvester Oar, of Kansas, Ill. A transverse rock shaft is journaled in boxes on the end of the car, and is provided with collars on the outside of the boxes. The outer ends of the shafts are bent to form handles, and a spiral spring is placed on the rock shaft between one of the boxes, and an arm that projects from the shaft. The projecting arm, when the rock shaft is turned up, engages with a catch on the end of the car. To the under side of this arm is attached a curved arm, and into the slot between the arms projects a pin that is secured to one side of the coupling link that is pivoted on top of drawhead. The outer end of the arm is attached to a rod that passes through an eye secured to the end of the car. Hooks that engage with the outer end of the coupling link are attached to the upper side of the drawboards. By means of the rods and handles at the end of the cars they may be coupled or uncoupled either from their top or sides.

Mr. Charles P. Williams, of Summit Point, W. Va., has patented a new car coupling that is adapted to be operated from either side of the car. The drawhead of the car is of the ordinary construction, and has a cross head, that is formed of two partially closed chambers that communicate with the interior of the drawhead by means of apertures through which a coupling pin passes. This pin has an arrow head at each end, by means of which a catch engages to withdraw the pin from the coupling link. The catch is pivoted to the inner end of a rod that projects through the crosshead. This rod has a spring coiled about it which has sufficient force to hold the catch against the drawhead, and cause the catch which is beveled at the end to be raised through an opening in the top of the crosshead, which opening is so constructed, that when the catch is drawn back it will engage with the neck of the pin. Underneath the crosshead on each side is fulcrumed a lever which is used to lift the coupling bar so that it will properly engage to couple the cars. The coupling bar is of the arrow head form.

Mr. James B. Bray, of Waverly, N. Y., has patented an improvement in car brakes, of that class in which all the brakes of the train are applied from the locomotive by means of a steam piston acting upon buffer rods extending the whole length of the cars, and it consists in running short stiff buffer rods through the trucks at each end of the car, and connecting these short buffer rods directly to the brake beams by springs, then joining the two inner ends of the short buffer rods to form a continuous connection by means of a traction rod running from truck to truck of the car, which traction rod is at each outer end connected to the inner ends of the buffer rods through a lever.

## ELECTRICAL INVENTION.

An invention, by which the loss of power resulting from the rapid reciprocating movement in electro-magnetic motors in which the vibration of armatures is utilized for power is avoided, was recently patented by Mr. John Du Bois Kieley, of Toronto, Canada. An endless belt extends around rollers and through the magnets, and has cylindrical armatures attached to it at regular intervals. The armatures are slightly longer than the distance between the magnets, and the space between them is equal to twice their length. The belt rollers are fast on their shafts, one of which carries also a balance wheel. The rollers are flattened on two opposite sides to receive the armatures and to prevent slipping. Each magnet is provided with a circuit closer, consisting of a bell-crank lever, one end of which projects into the path of the armature, so that when pressed down by the advancing armature the lever closes the circuit to the magnet next in advance. This occurs when the armature has passed the point of maximum attraction in one magnet and broken the circuit by its rear end clearing the lever. The armature belt is moved by a draught acting continuously in one direction of the armatures, thus avoiding changes of direction and utilizing the momentum.

## MECHANICAL INVENTIONS.

Mr. Rudolf Wittman, of New York city, has patented an improved device for rapidly and accurately measuring dimensions, such as curved and right lines. The dividers have the usual legs. A circular casing attached to the joint piece of the dividers contains a dial whose circumference is divided into any number of parts. This dial is connected by a train of cogwheels of equal size, with a tracing wheel of the same size and number of teeth pivoted to a projection of the casing. One revolution of this wheel corresponds with one revolution of the dial. A cogwheel having one tooth more than the wheels of the train engages with one of these wheels, and is provided with a pointer which passes through the center of the dial and revolves over its face. The casing is also provided with a rigid pointer extending from the middle of the dial to its edge. To measure a curved or right line, the instrument is inverted and the tracing wheel is rolled along the line to be measured, the dimension being given by the pointer on the face of the dial.

A new mechanical movement, designed to convert an oscillating movement into a rotary movement in a single direction, and to take the place of a ratchet and pawl mechanism, has been patented by Mr. James B. Bray, of Waverly, N. Y. A rotary shaft carries a gear wheel between two frame plates. A swinging frame is hung

loosely on the shaft and carries a pinion arranged to mesh with the main gear wheel. Upon each side of the swinging plate, on fixed bearings in the frame plates, are loose pinions that mesh with the main gear wheel. When the swinging frame is moved toward one pinion its pinion meshes both with the pinion on the frame plates and with the main gear wheel. All these wheels are locked together, so that when the swinging frame is moved forward it acts as a rigid lever on the shaft to turn it. When the frame is thrown in the opposite direction the direction of the movement of the shaft is reversed.

Mr. Samuel Irwin, of Lindsay, Canada, has patented an improved oarlock, by which the person rowing is enabled to face in the direction the boat is being propelled, thus facilitating the steering. The handle and blade sections of the oar are divided and firmly fixed in sockets formed with toothed segments at their ends that mesh into each other, and are fulcrumed between two plates which are held firmly together. When the handle section of the oar is pulled toward the rower the blade section will move in the same direction and propel the boat forward. To allow the necessary motion to the oar to permit it to enter and leave the water the fulcrum box has trunnions which rest in bearings secured to the gunwale plate of the boat.

## AGRICULTURAL INVENTIONS.

Among recent inventions we find a combined sheep rack and trough patented by Mr. Amer R. Yost, of Somerset, O. The base of the rack is of box form, open at the top, and provided with four corner posts. To the corner posts of the sides of the box are pivoted the lower bars of racks, adapted to swing toward or from each other, and the box is covered by a rack bottom that may be revolved to clean out the box. To the end posts of the rack and between their sides is pivoted a swinging end gate that is held from swinging by a pin. By this construction the end racks may be swung up and the rack bottoms removed. To the corner posts are also pivoted arms the outer ends of which are provided with an angular trough for feeding grain to stock, and the racks when swung upward form a wedge-shaped space for the hay, the feeding troughs serving as a support for the rack.

Mr. John Feldmier, of Oskaloosa, Kan., has patented a corn planter of the class in which the dropping mechanism is operated by a knotted wire or rope stretched across the field, and by means of which the rows are properly check-rows. The machine is supported on two wheels connected by an axle, to which is attached at the inner sides of the wheels two transverse bars. To these bars are pivoted side hoppers, connected by a crossbar attached to runners that open channels to receive the seed which passes from the spouts of the hoppers, and as soil falls back into its place it is pressed down by a wheel. To the center of the machine is attached a tongue, to which are pivoted two parallel bars carrying a central hopper provided with a runner in front and a wheel behind for preparing the soil and covering the seed. A three-armed plate is pivoted at its center to the cross bar, and to one of its arms is pivoted the seed dropping slides of the side hoppers, and to the second arm of the lever is pivoted the dropping slide of the center hopper, so that the seed will be dropped simultaneously from all the hoppers. The third arm of the lever is pivoted to a rod operated by the knotted check rope.

A device that cleans grain of all light impurities by means of friction and the blast of air which results from its passage down a steeply inclined pipe, has been patented by Mr. Sewall Truax, of Walla Walla, Washington Ter. It consists of two or more steeply inclined chutes arranged below each other, and connected by a vertical chamber. The grain passes from a hopper and is distributed over a screen which removes the coarser refuse and falls upon a fine screen. From this screen it is discharged into cups attached to a belt, its weight turning the belt cylinders, on each end of which are ratchets that jar the screens. When discharged from the cups the grain passes rapidly down until it is diverted from its course into an upright pipe by an adjustable slide. The velocity of the grain creates a strong upward blast, which carries with it all light impurities, while the clean grain falls to the bottom and is carried to the receiver.

An improved fanning mill has recently been patented by Mr. Johnathan D. Bush, of Lebanon, Mo. The fanning mill is of ordinary construction in the frame, casing, fans, and fan shaft, with the connecting gear and crank. To the outer end of the fan shaft is attached a crank, the pin of which passes through a longitudinal slot in a horizontal arm of a right angle lever that is pivoted at its bend to a post on the outer surface of the casing. The lower end of the vertical arm of the bent lever is slotted to receive a pin secured to the end of a lever that passes through the casing and extends across the mill and is pivoted to the opposite side. An arm projects from the forward side of this lever which is slotted at its outer end to receive a pin attached to the cross bar of the upper sieve shoe, and by this construction the upper sieves receive a vibratory motion. To the under side of the lever, near its center, is attached the shoe of the lower sieves, so that the shoe will be reciprocated by the vibration of the lever.

An improved mowing machine has been patented by Mr. William M. Webber, of Ravenswood, W. Va. The driving wheels and axle of the mower are of the ordinary construction. A rectangular frame is pivoted to the axle, and to this frame is secured the seat and tongue, and between its sides is an auxiliary rectangular frame that is pivoted at its front end to the axle, and its rear end extends beyond the main frame. A cone pulley fixed to the axle of the driving wheels, and a similar pulley of less diameter, is journaled in the sides of the auxiliary frame, the pulleys being connected by a belt. To the end of the small pulley shaft, opposite the pulley, is attached a universal joint. To arms attached to the main and auxiliary frames are hinged corresponding arms of a swinging frame, to which is attached the cutter bar, and in which is journaled a wheel provided with a serpentine edge upon its periphery. The shaft of this wheel connects with the pulley shaft of the auxiliary frame by the universal joint attached to its pulley shaft. The cutter bar is connected with

and receives its motion from the serpentine flange on the wheel of swinging frame.

A device by which uniformity in the distribution of fine fertilizers is secured has been patented by Mr. Charles R. Straughn, of Centreville, Md. Above the axle secured to the frame of a seed drill is the seed box, and immediately in its rear, and separated by a partition, is the fertilizer box. The seed is removed from the seed box by a seed-dropping cylinder, and falls into a tapering spout and passes through the hollow shank of the hoe to the ground. A tapering conductor spout is fastened to the bottom of the seed and fertilizing boxes. In bearings on the ends of the fertilizer box a shaft revolves, to which are attached as many bevel gear wheels as there are drills. This shaft is driven from the axle by a belt. Each gear wheel meshes into a bevel gear attached to the upper end of a shaft, the lower end of which works close to the bottom of the fertilizing box, and attached to it are devices which force the fertilizer into the bottom of the box, and it falls through the openings into the conductor spout, and passes with the seed to the ground through the hollow shank of the hoe.

Mr. Henry A. Robertson, of Haskins, Kan., has patented a cultivator that is easily controlled and adjusted. The axle of the cultivator is arched to form space for an auxiliary frame; at the rear end of the tongue is a short cross bar. From the ends of this cross bar braces extend forward and are secured to the tongue, their rear ends being secured to the arch of the axle at its outer ends. Two inclined bars meet beneath the middle part of the tongue, where they are hinged, and their rear ends extend beyond the axle, and are attached to an arched bar the horizontal end parts of which pass through keepers on the plow beams. This auxiliary frame is suspended under the main frame by means of chains attached to the bars, and which pass up to and over a segmented pulley that is controlled by a latched lever in the reach of the driver, and by which the height of the plows is regulated.

## MISCELLANEOUS INVENTIONS.

Mrs. Loretta Brownlow, of East Paw Paw, Ill., has recently patented a simple and convenient means for crushing and straining fruit in making jellies, etc. The device consists of an outer colander made of earthen or other suitable material that is perforated in its sides and bottom, and is straighter in its sides than an ordinary colander, and an inner vessel which is made of the same shape and material as the outer, and has numerous small projections formed upon its outer surface to adapt it to produce a rubbing effect upon the fruit placed in the outer vessel. In the rim of the inner vessel are formed holes to receive the arms of a spider, adapted to besprung into and out of the holes. To the center of the spider is attached a crank, by which the inner vessel is turned within the outer to crush the fruit and press it through the perforations in the outer vessel. In the opposite sides of the rim of the outer vessel are formed holes to receive the inward projecting points of spring arm tongs, that are provided for holding the vessel stationary when in use. A cover which fits into the mouth of the inner vessel adapts it to be used for a variety of purposes when separate from the outer vessel.

Mr. Anton Besse, of Vienna, Austria, has patented a new apparatus for cleaning grits, grains, etc., thoroughly and in an economical manner. A box is provided at its top with a hopper, into which the grits are poured. The outlet gate of the hopper is opened by the descending grits, but prevents air from passing back into the hopper. From the lower end of the hopper the grain passes down through a series of air spaces and inclined plates, and at each space the lighter parts are blown over, leaving the heaviest grain at the last division, and the different weights pass into different receptacles. The motion of the air which passes through the air spaces is produced by a suction apparatus that is connected with a channel in the rear of the box.

Mr. John H. Doyle, of Hillsborough, O., has patented a device for dilating the lips in operations in the mouth that holds them out of contact with the teeth and gums, without exciting the secretion of saliva or causing pain. It consists of two broad hooks, connected by means of a rubber tape and adjustable clasps. The hooks are made broad at their outer and inner ends, and their edges converge toward the bend, at which point they are made flaring to accommodate the curve of the mouth and prevent cutting. The inner end of the hook has a slightly concavo-convex surface, and is provided with a reflector, which is set in the concave side.

An improved locking bolt for railroad rails has been patented by Mr. Thomas J. Bush, of Lexington, Ky. Bolts are bent in such a manner as to form short vertical necks on long diagonal arms, and the long arms are notched on one side near their lower ends. The short parts are formed with screw threads to receive nuts. In securing rails with the locking bolts the cross tie is first bored diagonally in such a manner that the holes will intersect each other at the proper depth. The bolts are then inserted in the holes, the notches on their sides intersecting each other, the nuts applied to the bolts and screwed firmly down to the flanges of the rail, the lower ends being securely locked together within the cross tie.

A sectional impression cup capable of closing to diminish its width, and which can be readily taken apart when desired, has been patented by Mr. James V. McMann, of Waverly, Ohio. The cup is divided through the center of the handle, forming two sections, one of which has a lip fitting into a recess in the other, and secured by a screw, and the recess is made large enough to allow the lip to oscillate slightly therein when the sides of the cup are compressed together. With this construction the cup may be more readily inserted into the mouth of the patient than cups of ordinary construction.

An invention for rapidly and cheaply manufacturing nails for securing wires to fence posts has been patented by Mr. Charles W. Dean, of South Wareham, Mass. The nail blank is cut in one piece from a band of metal in such a manner that both ends of the blanks are pointed without further cutting. As the blanks are detached they form hook-headed nails with sharp pointed ends, and when the points of the heads are bent so that their outer edges are parallel with the inner edge of the body the nail is complete.

Mr. John Cochran, Jr., of Millwood, Mo., has patented

an improvement in churns. The body of the churn is cylindrical in form and has a shoulder near its upper end to receive and support the cover. The cover is made in two unequal parts, the smaller part being loose. The larger part is held to its place by buttons that take under cross grooves in the churn body. To this part of the cover is secured a casing that contains and supports the driving gearing. The casing has an outwardly projecting arm, in which a shaft revolves, to one end of which is attached a crank; on the other end is a large bevel gear wheel, the lower part of which meshes with a small bevel gear wheel upon a hollow shaft that revolves in a bearing on the churn cover. In the hollow shaft revolves another shaft having a small bevel gear that meshes with the gear of the driving shaft. To the lower ends of the hollow and solid shafts are attached cross bars to which are secured paddles. When the churn is filled and the handle turned the cross bars and their paddles move in opposite directions and the cream is rapidly agitated.

An improved shaving mug has been patented by Mr. Peter H. Leonard, of New York city. The invention consists in a shaving mug having a soap compartment provided with a spout projecting from the vertical partition of this compartment. This spout is beveled from the upper edge of the partition, whereby when the cup is slightly inclined the surplus water can flow from the soap compartment into the lower part of the mug.

Mr. John Myers, of Philadelphia, Pa., has patented an improved washboard, the frame of which is of the usual construction, except the top and bottom cross-pieces, which are provided with bearings for pivots of vertical sections. The vertical sections consist of wooden slats covered with corrugated metal, and pivoted at their ends, upon which they are made to oscillate. These sections are provided with a lateral opening and are strung upon a rubber band, which passes through the openings and is secured to the side frame of the board so as to yieldingly support the slats in one and the same plane. The washboard being open on both sides, and both sides of the sections corrugated, it may be used on either side, and will last twice as long as a board that is not reversible.

An improvement in umbrellas, parasols, etc., has been patented by Mr. Joseph Forster, of Vienna, Austria. The umbrella is provided with a support formed of four rods, the upper ends of the upper rods being pivoted to the plate of the umbrella; the lower ends of the lower rods are pivoted to each other at the handle, the adjacent ends of the upper and lower rods being pivoted to each other. To hold the supporting frame when the umbrella is raised the upper rods are united by a brace having one end pivoted to one of the rods and the other pivoted to a sliding sleeve on the opposite rod, the sleeve being held by a latch lever. When the umbrella is opened the rods bend outward at their joints and form an irregular lozenge shaped opening, into which the head and hat of the person carrying the umbrella can pass.

A heater for dwellings that provides pure air and is easily controlled has been patented by Mr. James H. Mackintosh, of Paterson, N. J. Around the upper and lower ends of the heater case are formed flanges, which are perforated to receive bolts that secure the case to the top and bottom plates, in which are formed holes to receive the ends of air heating tubes that are fitted air and water tight in the plates. In the opposite sides of the case are openings to receive the inlet and outlet pipes, through which hot water or steam is introduced into the space around the flues to heat the air passing through them. Air to be heated is introduced into the space below the bottom plate through a flue leading from the outside of the building.

An improved clamp for controlling the extension of gas fixtures has recently been patented by Mr. John F. Brown, of Brooklyn, N. Y. A circular case, apertured for the slide rods, has a screw collar for attachment to the fixture. In this case is an arrangement of disks and springs, and a spirally ribbed rod passing through the case and through apertures in the disks is checked in its movement by springs of such strength that their friction on the case holds the weight of the drop-light.

One of the recently patented novelties is a steam heated sadiron, invented by Mr. John M. Edmunds, of Salt Lake City, Utah Ter. The sadiron is composed of a lower chamber, the bottom of which is the smoothing surface of the iron, and an upper chamber connected with the lower by tubes extending almost to the top of the same, so that only steam can escape to the chamber below. This upper chamber has a screw-capped vent for pouring in water, and has also a safety valve. A hollow handle with solid shanks is secured to the top of the upper chamber, and has a vent for admitting oil. A tube provided with a regulating cock is screwed to the handle, and passes down to a lamp in the top of the lower chamber. The wick is ignited and heats the water in the upper chamber, converting it to steam, which passes through the connecting tubes into the lower chamber and heats the same.

A coffee and nut roaster that permits of convenient examination of its contents has been patented by Mr. Thomas F. McCaffrey, of Philadelphia, Pa. The roaster is constructed in two cylindrical sections that are hinged to each other at their open ends. The edge of one section fits into the end of the other, and a hasp is provided for locking the sections together. Each section has a series of apertures for the entrance and exit of air, and a rod projects from their closed ends, on which the cylinder is rotated. Strips project from the inner surface to stir the contents of the cylinder when it is rotated, so that they will not become burned.

A light, durable, and inexpensive horse collar, the body of which is made of paper and hollow, has recently been patented by Mr. Christopher G. Cale, of Albany, N. Y. The body of the collar is made of two sections, which are moulded from paper mache or paper pulp, mixed with some glutinous material. These parts are formed in a mould over a core built up of separate sections that are adapted to be drawn one by one from the ends of the body parts of the collar after the pulp has become fixed. The shells of the collar are stopped with plugs, and to these plugs are secured hinges that unite the parts of the collar at its lower end. To the plugs in the upper ends are secured loops and slots that are adapted to be engaged with and retained by each other when the upper ends of the collar are brought together.